

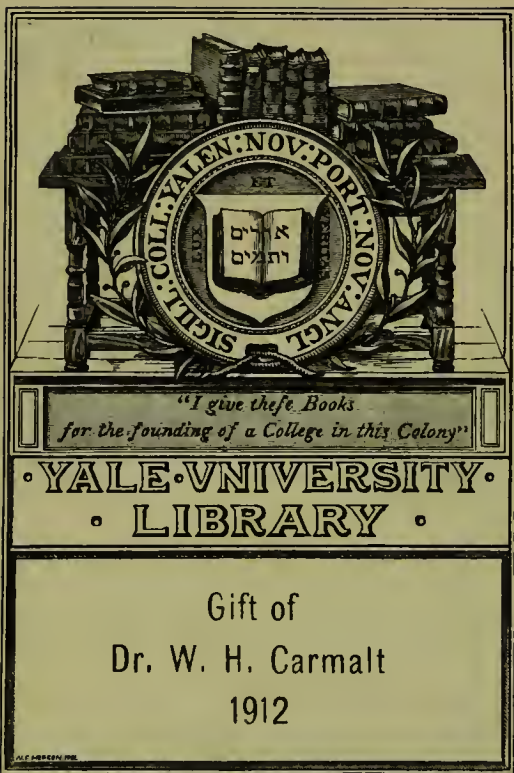
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VACCINE THERAPY
" in "
General Practice



by G. H. Sherman M.D.



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**Vaccine Therapy in
General Practice**

VACCINE THERAPY

—IN—

GENERAL PRACTICE

BY

GEORGE H. SHERMAN, M. D.



1911

DETROIT, MICHIGAN

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PREFACE

The purpose of this little book is to increase your interest in the use of bacterial vaccines in your every-day practice; to convince you, by the best means at my disposal, that vaccine therapy is one of the most effective additions to your therapeutic armamentarium and, I say it in all candor, to remind you that the products of my laboratories may be just as effective in your hands as they have been in my own or in those of hundreds of other brother-practitioners.

I have tried to tell the truth. I have not painted lurid pictures or even selected the most spectacular cases to give a far-fetched, erroneous impression. I have not minimized unseen dangers in order that they may be lightly passed over by you.

I explain elsewhere why I started this business—I was forced into it, and to tell the truth, I have not in the least regretted the combination of circumstances which led me this way. It is enjoyable to GET RESULTS; it is equally enjoyable to be called up over the phone, or to receive letters telling of RESULTS; *and I am confident that if you read this book through that you will be stimulated to try — and if you try, you must surely succeed.*

If you feel that this book is not complete — that something you wanted to know is not here — write me and

if I can I shall be happy to tell you. If you have any criticisms to offer I shall be glad to have them. If you are a doubter, I want to show you.

Rest assured that the subject of vaccine therapy in general practice is worthy of far greater study by the masses of the profession than it has as yet received and not only will the time taken to acquaint yourself with this work make you a more efficient physician, but it will inevitably add to your bank account — by no means a disadvantage!

G. H. Sherman M.D.

419 St. Aubin Avenue
Detroit, Mich.
Jan., 1911.

INTRODUCTION

BY HENRY R. HARROWER, M. D., CHICAGO, EDITOR OF
*The American Journal of Physiologic
Therapeutics.*

I have read the contents of this little book with very much more than ordinary interest and pleasure. From the time that I first became acquainted with the use of bacterial vaccines through my visit to Wright's laboratory in London and my subsequent experience with various bacterial vaccines, I have always felt that in the bacterial vaccines the profession would find the *open sesame* to success in the treatment of all infectious or germ diseases.

In other places I have expressed my opinion of this method of treatment in no uncertain terms. I am not ashamed to say that I am an enthusiast. I feel, like my friend Doctor Sherman, that those constituting the majority of the profession are passing by an immensely good thing if they do not use bacterial vaccines as a routine. I believe that the distribution of this little book will do much to stimulate an interest in this field and if it serves, as it is evidently intended, to increase Dr. Sherman's business, I am fully satisfied that it will only do so by increasing the business of those who may happen to read it and who were stimulated by the excellent ideas and suggestions it contains.

There are many important features of bacterial therapy which have been brought to light by various investigators and mentioned before in literature, but, so far as the rank and file of the profession are concerned, they are buried forever. In this book a number of them have been gathered together and, savored with the personal experiences of the author, will serve as a perpetual reminder of the vast possibilities of this growing branch of therapeutics. It is a pleasure to have written this brief preface and it is to be hoped that this little book may serve its purpose and serve it well.

CHAPTER I.

THE PHILOSOPHY OF VACCINE THERAPY.

That certain diseases are communicable, and that in many such diseases one attack renders the individual immune to subsequent attacks, has been known since the dawn of medicine; but it was left to our generation through the development of the science of bacteriology to work out the cause of disease and the nature of the immunizing mechanism thus teaching us how to take advantage of Nature's immunizing process and to apply it as a prophylactor and curative agent.

The first definite step in aiding Nature's immunizing process as a therapeutic measure was the application of antidiphtheric serum in treating diphtheria as brought out by Behring. The results with this serum were so strikingly beneficial that it was at once supposed that equally potent serums for treating other infections could be easily produced. This hope, however, has not been realized because the immunizing process against diphtheria infections is such that while repeated inoculations into lower animals increase the immunizing substances in the blood to enormous proportions, this does not happen if most other micro-organisms are used in place of the diphtheria bacillus.

Extensive research by numerous investigators shows that Nature employs various means to accomplish the immunizing process. Antitoxins are distinctly formed

in diphtheria and tetanus infections, by producing amboceptors resulting in bacteriolysis as demonstrated by Ehrlich, and also by forming agglutinins.

Metchnikoff found that the white corpuscles play an important role in the immunizing process as phagocytes or "devouring cells," having the power to take up germs and destroy them by a process of digestion. Sir A. E. Wright, following up Metchnikoff's work, found that the phagocytic power of the white corpuscles was very slow or almost negative unless the corpuscles are suspended in blood serum and that when suspended in blood serum obtained from previously immunized animals the phagocytic power is much greater than when suspended in ordinary serum. He also found that this increased phagocytic power is specific, it only taking place when the same kind of germs are used in the experiment that the animal was immunized with.

From these investigations Wright concluded that the blood serum contains a substance that has a sensitizing effect on the invading organism and that this substance is naturally increased during the immunizing process. This bacteriotropic substance has been termed an opsonin (Latin, *opsono*, I prepare the food for). It was this phagocytic power of the blood as demonstrated in the incubated test tube that led Wright to make extensive investigations as to the opsonic power of the blood in man under various conditions. A measurement of this power he calls the "opsonic index," and he obtains it by the following procedure:

Procure a bacterial suspension of the organism to be

tested for by washing a twenty-four hour growth of this particular germ off an agar tube with normal salt solution. Shake the suspension well to avoid clumps. Collect some of the patient's blood from a finger prick into a glass tube suitable for hanging in a centrifuge. By the same procedure procure blood from a healthy person to serve as a control. Centrifuge the blood in both tubes. Pipet off the serum from each tube and keep them separate. Pipet off some white blood corpuscles and wash them in normal salt solution. Now with a capillary pipet take equal volumes of the bacterial suspension, white corpuscles and the patient's blood serum and mix them. With another capillary pipet take equal volumes of the bacterial suspension, white corpuscles, and serum from the control blood and mix them. The mixtures are now drawn into their respective pipets and incubated for fifteen minutes. Slides are then made from each pipet and stained with a suitable blood stain (Wright's or Hasting's). The germs found in from 30 to 50 leucocytes on each slide are counted and the total number of germs found on each slide are then added together and divided by the number of leucocytes counted. This will give the average number of germs ingested by each leucocyte. Now by comparing the average number of germs ingested by the leucocyte suspend in the patient's serum with those taken up in the control serum, one obtains the patient's opsonic index or a measure of the germ-destroying power of his blood.

Immunization for therapeutic purposes is done in two ways, viz: by employing immune sera or vaccines. It

is important that the difference of the two methods be kept clearly in mind.

When a serum is employed we inject under the skin ready prepared immune substances combined with the blood serum obtained from highly immunized animals to aid the patient in overcoming the infection. When a vaccine is employed, previously prepared and sterilized pathogenic bacteria suspended in normal salt solution are injected under the skin.

The question here naturally arises: How can sterile vaccines immunize? What effect can dead germs have on living ones when injected under the skin? The immunizing process is a more or less complicated one, but enough of it is understood so that quite definite data may be obtained. By means of the opsonic index Wright conclusively demonstrated that during the immunizing process against pathogenic bacteria Nature automatically increases the opsonic power of the blood, resulting in a materially increased phagocytosis. He also found by taking the opsonic index at short intervals that when a sufficient number of previously sterilized pathogenic bacteria are injected under the skin, the immunizing power of the blood is aroused, producing more opsonins and likewise resulting in an increased phagocytosis.

In many instances the natural immunizing process in a case of infection is too sluggish to prevent the infection from spreading. Under such conditions if vaccines are employed sufficiently early the immunizing mechanism is aroused into activity and the establishment of an immunity is thereby hastened. From this it will be seen

that the vaccines do not destroy the germs causing the infection but simply stimulate the immunity-producing apparatus, thereby eliminating the ill effects of the infection.

Repeated opsonic readings furthermore showed that the increased germ-destroying power resulting from a single dose of vaccine would continue from five to ten days or more, and that if the inoculations are repeated at proper intervals this immunity would become permanent.

CHAPTER II.

EARLY PERSONAL EXPERIENCES.

I have been in the general practice of medicine for twenty-seven years having come into practice just when medical thought was on the dividing line between the old conception and the new, when aseptic surgery was not yet in general use. I well remember seeing the first aseptic operations performed in Mercy Hospital and Michael Reese Hospital of Chicago.

I have been in practice long enough to see the awful results of diphtheria before we had antidiphtheric serum and was one of the first to use it in Detroit, having used some of Behring's imported serum before the domestic product could be obtained.

After seeing the brilliant results with antidiphtheric serum I became a serum enthusiast and, like many another, expected that other infectious diseases could be treated in the same manner. I used some antitubercle serum and have also had an extensive experience with antistreptococcus serum.

Sometimes the results seemed brilliant and at other times negative. I read three papers before three different medical societies on the use of antistreptococcus serum in articular rheumatism. In acute cases my results with this remedy were generally good. In subacute and chronic cases the results were good if the case could be cured before the patient became sensitized

to horse serum, the condition now known as anaphylaxis. When this occurred it was, of course, necessary that the serum treatment be discontinued.

I became interested in Wright's work and used staphylococcus aureus vaccine for the first time in a very bad case of palmar abscess in the fall of 1906; a case, by the way, that promised under ordinary treatment to result in a permanently crippled hand. The inflammatory process subsided promptly after the first dose of stock vaccine. A few more doses were given with the result that the hand was restored to its former usefulness.

The remarkable results in this case naturally aroused my interest. Not long after I had some streptococcus vaccine made at the Detroit Clinical Laboratory from a culture obtained in a case of tonsilitis.

Some of my patients suffering from rheumatism at that time had been showing signs of an anaphylaxis from the serum treatment, but had not recovered from their rheumatism. I began to use streptococcus vaccine in these cases and found that the results were not only more uniform and better than from the antistreptococcus serum, but all the disagreeable results of serum reactions (urticaria, anaphylaxis, etc.), were avoided, thus making it possible to treat cases over a much longer period of time.

By this time my reputation for curing rheumatism had extended beyond the limits of Detroit and out of town rheumatics would consult me. They were nearly always chronic cases which required treatment for some months.

Usually they were not in a position to stay in the city for treatment, and such cases I always turned back to the family physician.

The vaccines not being regularly in the market I supplied them to these physicians. In time I began to use vaccines for other purposes and, of course, recommended them to my professional friends. They began to use them. Out of town physicians who were treating my patients recommended them to others and before I was aware of it I was in the vaccine business. I did not go premeditatedly into this business but was dragged into it. Meantime I had fitted up a laboratory especially adapted to making bacterial vaccines. Not having time to do all the laboratory routine and attend to my practice at the same time, trained bacteriologists are employed to do the work.

CHAPTER III.

VACCINES IN EVERY-DAY PRACTICE.

The science of bacteriology has unravelled many mysteries of disease. While clinically we have an endless variety of diseases, biologically we have comparatively few. For example, we may have a bronchitis, iritis, neuritis, mastoiditis, tonsillitis, endocarditis, arthritis, cystitis, appendicitis, peritonitis, lymphangitis, otitis, erysipelas, septicemia, or even gangrene all caused by the streptococcus. Clinically these conditions are all different, yet biologically they can only be the same.

What is true of the streptococcus is equally true of the pneumococcus, staphylococcus, gonococcus, colon bacillus, tubercle bacillus and other organisms. Mixed infections of two or more of these organisms are not uncommonly met with. When we realize that the infections caused by these organisms are the common ailments encountered in the every-day practice of medicine it should not require much argument to show that they should be applied in general practice *if they really do the work*. Medicines in these ailments admittedly are of questionable curative value.

One great advantage in the vaccine treatment is that it is very easily administered. The usual hypodermic method is used. The dose is not bulky and usually little or no local disturbance is caused where the inocu-

lations are made. By this method of administration we are always sure that the patient gets just what we intend him to have. Inoculations being required only at moderate intervals, the patient rarely objects.

The advantages of this method of treatment are thoroughly appreciated by the average nurse or mother in treating infants and children. Everybody knows how difficult it is to give such little ones medicine. A few doses of vaccines will accomplish much more for the patient, and the bother of drugging the sick child, often with no effect whatever, is dispensed with.

The question naturally arises, is there any danger in giving the vaccines. This question should only be answered by those having had an extensive and varied experience with them. In this regard I am somewhat favorably situated, having used over five thousand doses in my own practice in the treatment of acute and chronic cases. I have also supplied more than twenty-five thousand doses to physicians with whom I am always more or less in touch by correspondence, and here in Detroit frequent consultations and almost daily inquiries and reports of cases over the phone have increased this experience.

In all of my work with bacterial vaccines I have never had a case where any harm could be attributed to the vaccine, nor have I had any complaint from physicians using my products. My experience in this regard is abundantly verified by others who have had an extensive experience.

I will quote a few pointed paragraphs from a recent editorial* on this subject:

"The growth of vaccine therapy—that most wonderful addition to the possibilities of the work of the general practitioner—has been hampered to no inconsiderable extent by a mistaken and exaggerated fear of the dangers of the so-called 'negative phase.'

"Rather than dilate here upon the physiology of this phase, which we presume is appreciated by our readers, we will endeavor to instill a feeling of confidence to supersede the dread which has seemingly been all too common.

"Vaccines are not dangerous. This statement is made with all due deference to the feelings of many whose articles and statements we have read or heard. We qualify our statement by adding 'if properly used.' It is evident that the utilization of bacterial vaccines carries with it possibilities of harm; but no more so than the use of every drug in the *Materia Medica* and, for that matter, every procedure in physiologic therapeutics.

"In our opinion the majority of the profession, by more widely adopting vaccine therapy, would be doing themselves a benefit which would increase their control over many of the germ diseases (particularly those of a chronic nature) and incidentally add a large measure to their professional prestige—and their remuneration."

I also quote here several interesting paragraphs from

**The American Journal of Physiologic Therapeutics*, November, 1910, page 190.

an article by Professor Timothy Leary of Boston,* on this subject: "The objections to the use of vaccines in infectious conditions seem to focus themselves against their use in general infections. They will, therefore, be considered here. The general harmlessness of vaccines is indicated by two cases of infection in which, through error, 10 ccm. of staphylococcus pyogenes aureus vaccine containing 10,000,000,000 organisms were injected at one time as an initial dose. In one case no untoward symptoms appeared. In the second there was a temporary collapse, with prompt response to heat and stimulation. There are few powerful drugs in the pharmacopeia which could be used with such disregard for dosage without serious results.

"The most obvious objection to the use of vaccines in general infections is that the patient is undergoing extreme intoxication. I have called attention to our theory of muscle immunity, and to the fact that physiological doses of vaccines are not followed by a toxic (negative) phase. The dose of vaccine used in pneumonia, for example, contains fewer organisms than will be found in a few out of the myriads of infected air sacs of the lung in this disease. The dosage is so infinitesimal, and its toxic effect is so slight, if any, that it is not measurable. As evidence that even much larger doses are at least harmless, I might cite the case of a child of seven years undergoing an infection with pneumonia, with a temperature of 103 and extreme meningeal symptoms, into whose body was injected, as an initial

**Boston Medical and Surgical Journal*, Oct. 6, 1910, page 529.

dose, 1,600,000,000 pneumococci. The standard dose for adults is 8 minims, or 100,000,000 pneumococci. This child, receiving sixteen times the adult dose of vaccine, not only did not show harmful results, but began to mend shortly following the initial injection and recovered under daily injections of several times the usual adult dose. A second child with pneumococcus meningitis showed prompt diminution in the cerebro-spinal fluid, and sharp amelioration of symptoms accompanying the use of four to eight times the standard adult dose of pneumococcus vaccine."

Dr. W. H. Watters of Boston* has this to say on the subject: "In general septicemia of streptococcus origin, we have frequently observed distinct amelioration following the hypodermic administration of bacterial emulsions, both autogenous and stock. This is by no means universal, however, some apparently hopeful cases finally succumbing to the disease. In even these fatal cases we can usually note clinically an increased degree of resistance on the part of the patient with a correspondingly prolonged fight before finally overcome. It is in puerperal septicemia, however, in which some of our most satisfactory results have been obtained."

In an excellent paper† recently published Russell says, among other things, that "Vaccination during the disease (typhoid fever) for therapeutic purposes, fails to reveal any evidence of a negative phase."

**The New England Medical Gazette*, September, 1910, page 408.

†*Bulletin of the Johns Hopkins Hospital*, March, 1910.

CHAPTER IV.

THE GENERAL USE OF BACTERIAL VACCINES.

Should the vaccine treatment be left solely to those having laboratory facilities and who are trained bacteriologists? Or may not the general practitioner avail himself of the great advantages accruing from this method of treatment? In answering these questions it is necessary to consider what the attending physician is expected to do. If he is expected to do bacteriological laboratory work and make his own vaccines before administering them, he necessarily should be familiar with that kind of work. Clearly that is no more necessary than that every doctor should make his own diphtheria antitoxin, strychnine, fluid extracts or any other remedy that he uses. He should have a general knowledge how these things are done, but the technical knowledge belongs alone to the one who is trained in making them. The essential element that counts for competency in a physician is his ability to discern clinical conditions and apply the appropriate remedy at the right time. In applying the remedy it is necessary for him to know what results are to be expected and how to interpret them clinically. This ability is acquired by diligent and close observation in actual practice.

To use vaccines intelligently, a general knowledge of bacteriology and active immunization should be obtained. With the amount of current literature published on this

subject there is absolutely no reason why the general practitioner should not be in possession of such knowledge; if not, he can with a little trouble acquire it. Clinical experience and his knowledge of how to observe the results of applied remedies, enables the general practitioner to readily take up the vaccine treatment and use it with good results.

The wide scope for the successful application of the vaccine treatment can only be appreciated by those having a large experience with its use. When we consider that most of our ailments have been traced to some germ, and that most of the common ones are caused by a small group of organisms, the tremendous influence for good that this method of treatment is can be appreciated. The practical value of a remedy depends largely on the prevalence of the ailment to which it is successfully applied.

It is of more importance to have a good remedy for "colds" because they are very annoying and met with daily, than to have a remedy for sarcoma of the tibia. A cold is not as innocent an affair as it appears and this is seen all too often from what may follow it. The infecting organisms causing a "cold" may spread from the nose to the ear, mastoid cells, tonsils, bronchi and other parts of the body leaving in their wake a train of serious conditions.

The most prevalent ailments met with are caused by the pus group of organisms, Staphylococci, Streptococci, Pneumococci, Colon Bacilli and Gonococci. Conventional treatment with medicines in these infectious processes

is of little practical value. They are not curative agents. At best they only give relief while Nature effects a cure. These vaccines are real curative agents because they stimulate the immunizing mechanism of the body and thereby hasten the establishment of an immunity. The inability to successfully cope with these infectious processes has been the chief cause of bringing the medical profession into disrepute in the estimation of many well-meaning people, and is undoubtedly responsible for much of our quackery and many of the innumerable patent medicines.

These conditions exist because the regular profession heretofore has not been able to do enough. Bacterial vaccines will in a very large measure supply this want and restore an increasing confidence in the virtues of the medical profession.

Taking the opsonic index as a means of determining the size of the dose and when to repeat the inoculations is now comparatively little used. As a scientific means of demonstrating at least one of the means of immunization, it has been of inestimable value. With it the therapeutic value of bacterial vaccines has also been scientifically demonstrated, but as a guide to the administration of vaccines it is no more reliable than the clinical symptoms. To be of practical value the index should be taken at short intervals at least once daily during the course of acute infection.

Since the estimation of the opsonic index is an elaborate technical procedure requiring special laboratory training and considerable time, this places it beyond the

possibility of the busy practitioner and the financial ability of the average patient. There are several reasons why the opsonic index is no more reliable than the clinical symptoms: First, the opsonins are not the only factors in the immunizing process; second, the opsonic power of the individual's blood used as a control may fluctuate; third, the technique is too elaborate to be exactly relied on; fourth, the individual taking the index must have a large experience in the work, a requirement not readily at hand.

The clinical symptoms to be relied upon as a guide are the temperature, rapidity and character of the pulse, the patient's feelings and expression, amount of swelling and inflammatory reaction in local infections and the amount of pain and suffering. The nearer these approach the normal the better the immunizing response. Wright did some extensive opsonic index work to determine the relation of the immunizing power and pain. He found that during an inflammatory process there is always much pain until the immunizing powers are raised. I have often observed that the cessation of pain in an inflammatory process is the first indication of actual improvement after giving bacterial vaccines. This is particularly noticeable in acute articular rheumatism.

A positive phase is a condition in which the immunizing powers are sufficient to prevent the extension of an infection and ultimately to eradicate it. This condition may be brought about by the stimulating effects on the immunizing mechanism emitted from substances produced during the infecting process, or by the artificial stimulat-

ing effect on the immunizing mechanism resulting from bacterial inoculations.

The negative phase, on the other hand, is a condition in which the immunizing powers are insufficient to cope with an existing infection. Wright has written extensively about the negative phase in its relation to therapeutic inoculations and seems to think it always follows after giving a dose of bacterial vaccines. Wright worked very extensively with tubercle vaccine after the use of which the negative phase is, comparatively speaking, more prominent than with any other germ, and is very marked unless exceedingly small doses are employed, tubercle vaccine being distinctly toxic. It is probable for this reason that the negative phase idea fixed itself so firmly on his mind. Bacterial vaccines employed in treating the pus group of infections are nontoxic unless used in tremendously large doses. It is for this reason that large doses should be avoided until the patient has been under treatment for a short time and the effects of previous doses observed. In starting treatment enough should be given to obtain a physiological immunizing response without the negative phase, and the dose should be repeated when clinical symptoms indicate that the immunizing effect of the previous dose is beginning to wear off.

CHAPTER V.

THE FEAR OF THE NEGATIVE PHASE.

A great deal of stress has been laid in the literature upon the importance and remote influence of the administration of bacterial vaccines, in spite of the fact that unquestionable good has been accomplished by far the largest majority of investigators. It would seem that a great deal of unnecessary stress has been laid on the negative phase in acute infections (as described by Wright). As a matter of fact much dwelling upon this phase has needlessly alarmed many physicians and kept them from using bacterial vaccines.

I am not going to commit myself by denying Wright and his authority, nor am I going to deny the many statements made concerning the importance and duration of this negative phase, but I do emphatically state, without reservation, that the study of bacterial vaccine therapy in general practice and from the standpoint of the general practitioner, has received a serious setback because of the much-vaunted dangers of the negative phase.

To be straightforward and candid I set very little stock on these discussions. Accidentally and on purpose doses have been given many times in excess of the so-called average normal dose. The experience of Leary of Boston, related elsewhere* and of several investigators have

*See quotation on page 30.

shown that immense doses of bacterial vaccines have been followed by reactions which were so comparatively slight as to be almost negligible. From this I do not wish the reader to infer that bacterial therapy may be used with impunity and with no knowledge of the value and workings of bacterial emulsions, but that the administration of an ordinary size dose (graduated under the system by which all of my own work is done) it is impossible for anyone to inadvertently give more than the regular dose, with absolutely no fear of serious untoward effects.

Repeatedly I have used large doses of purely empiric vaccines in acute cases where prompt action was evidently necessary and no definite diagnosis was yet available. Never have I had even as much as an unpleasant effect from one of the 5,000 or more injections which I have myself given, nor have I heard from hundreds of physicians, that they have had any unfavorable results from using these products.

If the broadminded physician will look at this in the light of present knowledge he will be surprised to find how harmless these vaccines really are.

If, in a case of prostration with a weak, rapid pulse resulting from general streptococcic infection, the patient should die after receiving a dose of streptococcus vaccine, would that be any argument that the vaccine was harmful? Such cases usually die under any treatment; but if such a case should recover or the life be prolonged the least that could be said is that the vaccine did no harm. I have seen practically hopeless cases of puerperal

infection recover under the vaccine treatment while in other advanced cases no benefit was obtained.

Extensive observations have convinced me that the immunizing response after an inoculation of a vaccine, differs from that resulting from an advancing infection. Advancing infections, especially those due to the streptococcus, are distinctly toxic as shown by the rise of temperature, rapid pulse and often severe pain, headache and constitutional depression. Nothing of the kind is observed after a dose of streptococcus vaccine. If given to a healthy individual absolutely no disagreeable constitutional effect is noticed and the local reaction where the injection is made is usually no more than that resulting from a dose of sterile water. If this same dose is given to a case having a streptococcus infection, instead of increasing the toxic symptoms, very often shortly after the inoculation the patient begins to improve noticeably.

The following case is a splendid illustration: A woman in ordinary health slightly cut her thumb while paring fruit. The cut was so slight that it was disregarded, and not even bandaged. She dressed some chickens and infected the wound. The next day, September 12, when I saw her, the thumb was badly swollen, cyanotic and very painful. A red lymphatic streak extended to the shoulder with the glands at the elbow badly swollen. The temperature was 100 degrees. Clinical symptoms indicated an unquestionable streptococcus infection. Since it was a skin involvement where staphylococci are usually also found, I gave a mixed vaccine containing

30,000,000 streptococci and 100,000,000 each of staphylococcus albus and aureus without waiting for a bacterial examination. By the next day, September 13, the temperature was normal, the red lymphatic streak reaching below the elbow. The thumb was still painful and swollen, the glands at the elbow were slightly more swollen but not so painful. By September 14, the inflammation on the arm was still present at the elbow glands and tissues around them, temperature normal, thumb swollen and painful. I repeated the dose of mixed vaccine. The following day, September 15, the swelling at the elbow with involved glands was rapidly diminishing and in a few days later had entirely disappeared. The thumb was still much swollen and cyanotic, the nail being blue. Around the point of infection a distinct line of demarcation appeared showing a gangrenous patch three-eighths of an inch wide and five-eighths of an inch long.

Local treatment from the start consisted in keeping the thumb wrapped in a gauze bandage which was continually kept saturated with a 1 to 4,000 bichloride solution. This kept the feverish skin moist and at the same time acted as an antiseptic. The interesting point in this connection is to show of how little value local antiseptics really are when the infecting process has gone beneath the skin. On September 18 the dose of vaccine was again repeated. Three days after this the hand became somewhat swollen and by September 22 the temperature had again gone to 100 and thumb very painful. On this day 50,000,000 streptococcus and 100,-

600,000 each staphylococcus aureus and albus was given. On the 23rd the temperature was normal, but unmistakable signs of pus appeared in the space between the thumb and hand. A small incision was made and about one dram of pus allowed to be discharged. After this the case progressed favorably with the exception of the gangrenous portion which required ten days to separate and come out. The slough extended down to the periosteum. The wound granulated over rapidly and healed, and the thumb was restored to its former usefulness.

The infection in this case was an exceptionally virulent one. Any one who has had experience with a streptococcus that will cause gangrene within the first few days of an infection, knows that under the conventional treatment this patient would have at least lost her thumb, probably her arm and possibly her life.

The prompt relief of toxic symptoms with reduction of temperature and also of the inflammatory process along the arm after a dose of stock vaccine shows not only the therapeutic value of the vaccine but also shows a distinct difference in the action of the vaccine on the immunizing mechanism as compared with that due to the progressing infection.

The infection made an impression distinctly toxic in effect, while the inoculation of dead organisms made no toxic impression but rather had an immunizing effect. If the toxic element in the infective process is the one that stimulates the immunizing mechanism, as many contend, a time would inevitably be reached in every acute infective process where the immunizing apparatus would

be sufficiently stimulated to bring about an immunity, but in actual practice we often find the reverse to be the case. Instead of the patient becoming immune to the infecting organism he dies, not from tissue exhaustion, but from toxemia or paralysis of the nerve centers.

There seems to be a toxic element in these cases that not only has no beneficial influence on the immunizing mechanism but actually hinders it. This seems to explain why it is that vaccines are most efficient when given early in the course of an infection. In the case referred to above it seems probable that if the administration of the vaccine had been delayed one or two days there would have been enough toxic material absorbed to cripple the immunizing mechanism altogether. The toxic materials being produced in superabundance, so irritate the surrounding tissue that they thereby hinder the absorption of the substances needed to stimulate the immunizing mechanism.

On the other hand with the use of a vaccine enough dead organisms are thrown under the skin elsewhere to produce a reaction but not enough inflammation is produced to prevent the absorption of the substances which stimulate the immunizing faculty of the system.

Any one having a large experience with bacterial vaccines can not help being impressed with the marvelous disappearance in many cases of an inflammatory process after one inoculation. All this can not very well be ascribed to the vaccine. It is more reasonable to suppose that after the immunizing mechanism has been sufficiently stimulated by the vaccine to retard the in-

flammatory process that additional immunizing stimuli are set free from the infected area.

This unlocking, as it were, of immunizing substances in an inflamed area after the swelling subsides probably also explains why diseases like pneumonia so often recover by crisis.

This combined effect of the vaccine and the immunizing influence of the inflammatory process making a double impression, as it were, on the immunizing mechanism seems to explain why it is that in many cases an immunity established after using vaccine is more permanent than one that comes about in the natural course of disease. This is particularly noticeable in rheumatism, furunculosis, tonsillitis, ordinary colds, etc.

In explaining the toxic character of infection Doctor Leary suggests, "It is possible that there is some selective action in absorption so that certain beneficial stimulating substances may not be taken up by the lymph stream from the focus of infection."*

A notable exception to this quite general action of vaccines is the action of tuberculin (either T. R. or B. E.) which is quite toxic in cases of tuberculosis. It must be given very cautiously and in extremely small doses at comparatively long intervals to avoid a negative phase.

When the non-toxic action of vaccines is once thoroughly understood as demonstrated by actual experience, the erroneous ideas considering vaccines dangerous in

**The Boston Medical and Surgical Journal*, Oct. 6, 1910, page 529.

acute infections will no longer find a place in medical literature.

It was the half-digested ideas published about the dangers of diphtheria antitoxin that retarded the general application of this most useful remedy for a long time, and I regret that this early impression is still lingering especially among the laity and as a result the anti-toxin treatment is often delayed until it is too late to do any good.

CHAPTER VI.

HOW TO BEGIN THE USE OF VACCINES.

This is a very important matter, as a mistake made at the beginning often discourages the physician. There is much truth in the old adage: "Well begun is half done." Too much stress cannot be placed on the necessity for the beginner being reasonable. I repeat, "Vaccines are *not* cure-alls."

THE SELECTION OF THE FIRST CASE.

Frequently when a physician considers using vaccines for the first time he looks up some old hopeless case and considers it a good one on which to "try them out." At times in such cases he will be most agreeably surprised by the results, but often no benefit will be obtained. It is the "trying out" of the vaccines in such cases that leads physicians to say that they "have tried them, but could see no benefit."

The therapeutic value of vaccines can no longer be questioned, but because of this we must not conclude that they are infallible. While as a rule results are brilliant, every now and then we meet a case in which no benefit is obtained even when autogenous vaccines are employed. This condition is sometimes found in chronic infections. It seems that in such cases in consequence of frequent autoinoculations the immunizing mechanism is worn out and fails to respond to the stimulating influence of the vaccine. Wright has pointed out that

some of these failures in long-standing localized infections are due to the large amount of inflammatory products surrounding the infected area, thus impeding the free access of blood serum. In such cases he recommends Bier's bandage and other local treatments in conjunction with the vaccine treatment.

Wright also points out that the opsonic index is often raised after a massage treatment in infective inflammatory processes. He argues that in such cases the massage causes a setting free of germs from the inflamed area and thus acts as an auto-inoculation.

In using bacterial vaccines the important question that always confronts us is: What is the infecting organism? The first reply that suggests itself is: Make a bacterial examination. But this is often impossible. In many instances the infection is of such a nature that the germ cannot be procured. The following case is a good illustration:

A young man applied for treatment, having enlarged lymphatic glands above the elbow and in the armpit. Two glands above the elbow were as large as medium-sized hickory nuts, while the one in the armpit was not quite so large. They were very tender and had been noticed only three days. There was no red chain connecting them. The temperature was $99\frac{1}{2}$. Search for the source of infection revealed a small scratch in the palm of the hand received five days previously which had healed over. Bacterial examination was impossible. By waiting until these glands suppurated a bacterial examination could have been made by procuring some of

the pus, but that would do the patient no good.

By using a little judgment an approximate diagnosis can be arrived at. Clinical symptoms indicated a streptococcus infection, but staphylococcic infection was also possible, consequently a mixed vaccine consisting of 30,000,000 streptococcus pyogenes and 100,000,000 each of staphylococcus pyogenes aureus and albus was given. Improvement began within twenty-four hours after the inoculation and in five days the swelling in the glands had entirely disappeared, making a complete recovery without any further treatment.

No one can know what the consequences in this case might have been had the vaccine not been used. It was certainly better to head off the infecting process by giving vaccines, than to neglect it until an exact diagnosis could be made.

Take another instance: A man tramped on a nail. Forty-eight hours later, when I was called, the foot was badly swollen and very painful, but the inflammation was on the top of the foot and not where the nail entered. The small opening was practically closed. His temperature was 100. Bacterial examination here would have been of no diagnostic value because the germs found at the point where the nail entered might not be the same as those causing the infection. Clinical symptoms indicated either staphylococcus, streptococcus or a mixture of both organisms. A mixed streptococcus and staphylococcus vaccine was accordingly given. In twenty-four hours his temperature was normal with the inflammation receding. Two days later another dose of the same

vaccine was given. He made a prompt recovery and all signs of the trouble abated in a few days.

Every one who has had any experience in midwifery looks with apprehension on a rise of temperature, associated with headache and rapid pulse a few days after a confinement, fearing he may have a streptococcus infection to deal with, no matter how carefully aseptic precautions may have been carried out. A streptococcus infection in the puerperal state is a serious matter and should be gotten under control as soon as possible. To verify the diagnosis by bacterial examination of the uterine discharge means delay, even in institutional practice where facilities for such work are close at hand. A smear may be examined, but the bacterial condition can not be definitely determined until a culture is incubated and examined. This means at least from 12 to 18 hours, delay. In general practice the delay is even greater. Under such circumstances is it advisable to postpone vaccine treatment until a positive bacterial diagnosis can be made?

Such a procedure is not advocated in treating diphtheria with anti-diphtheric serum. La Play's recommendation* is quite generally practiced. It is: "Do not wait for a report on the culture. Use the anti-toxin at once and freely; in this way not only will the mortality be reduced, but the complications will be less severe and less frequent."

The same rule applies with equal force in puerperal infections. Delay is altogether too dangerous, while giv-

**Progressive Medicine*, March, 1907, page 127.

ing a dose of vaccine is quite harmless even should no corresponding infection exist. Some one may object on the ground that such procedure is not scientific, because other organisms may be present. Grant it, but the streptococcus is the one organism (with the very rare possible exception of diphtheria or tetanus) that should be guarded against and it is only by giving streptococcus vaccine early that this can be done. If other organisms are suspected of being also present or later demonstrated by microscopic examination a mixed vaccine corresponding to the various organisms present may be given with advantage. Naturally the colon bacillus is often found in these cases. When present there is a foul odor to the discharge. Staphylococci are also often found and some of these are quite virulent causing much local disturbance. For this reason it is good practice to give a mixed vaccine containing streptococci and staphylococci in cases where the character of the discharges indicate that there are no colon bacilli present, and where colon bacilli are found, or where their presence is suspected, give a combination of streptococcus and colon bacillus vaccines.

In this connection it is well to consider the question of giving mixed vaccines and what effect such vaccines have if no corresponding infection exists to all the organisms presented in the vaccines. In this regard it should be realized that the dose of vaccine given for therapeutic purposes is small and will make no noticeable impression even if given in health. No one can realize how harmless a dose of vaccine is, until he has tried it

on himself.

AUTOGENOUS VACCINES OR STOCK VACCINES.

The question of autogenous versus stock vaccines deserves careful consideration. An autogenous vaccine is one in which the organism used in making the vaccine is taken from the patient to be treated. This same vaccine would be a stock vaccine for any other patient having the same kind of infection. That the use of an autogenous vaccine is scientifically correct must be admitted, since it gives us a vaccine of the exact organism causing the infection, but in practical application it is not an easy matter and is often surrounded with many difficulties. Many infections are of such a nature that it is practically impossible to procure the organism for the production of an autogenous vaccine, and in acute infections where the organism can be procured the necessary delay in making the autogenous vaccine before treatment is started, is often of decided disadvantage.

To make an autogenous vaccine the culture must be procured and incubated eighteen hours to obtain a growth. Very often it will be found that the growth shows several kinds of organisms, there being a mixed infection present. Then subcultures to separate the various kinds of germs must be made and again incubated eighteen hours, then the vaccine must be made including the count of the organisms, and the sterilizing process. After this sterility tests should be made by incubating at least twenty-four hours before the vaccine should be used.

Imagine an average practitioner hunting around for

a culture tube, especially in a small town, then sending it to some place where bacteriological laboratory work is done and waiting until the autogenous vaccine is returned, in a case of puerperal sepsis, infected wound, erysipelas, pneumonia or any other acute infectious disease. Meantime the infection will have progressed in many instances to a point where the vaccine will be no longer of any avail, no matter how well made or whether autogenous or not. Such foolish delay is not advocated even by those who urge the use of autogenous vaccines under favorable circumstances where facilities for making them are close at hand. All advocate the use of stock vaccines in such cases to check the progress of the infection while the autogenous vaccine is being prepared. If a stock vaccine is efficient in checking the progress of an acute infection, why not continue using it? How are we to know when the patient is improving from the dose of stock vaccine, that the autogenous vaccine will do better?

I have used autogenous as well as stock vaccines extensively and feel confident that future experience will fully justify my opinion that in acute infections stock vaccines, when given early, will give as good if not better results than autogenous vaccines, especially, when one considers the delay necessary in making them. Autogenous vaccines should be used in subacute and chronic infections where stock vaccines have failed to give the desired results, and also in cases where bacterial examination shows an unusual organism present.

The essential feature in making good stock vaccines is

to carefully select the cultures, make them up while fresh and sterilize them just enough to kill the organism.

So also if a mixed vaccine should be given having streptococci, staphylococci and pneumococci where only a pneumococcus infection should exist, the streptococcus and staphylococcus will have no effect except to raise the immunizing powers against these organisms as well as against the pneumococcus. This is an advantage as it serves to fortify the individual against a later possible infection by these ever-present micro-organisms. At all events I have never seen any harm resulting from giving a mixed vaccine.

CHAPTER VII.

VACCINES IN ACUTE DISEASES.

On account of the fact that the nontoxic effect of physiological doses of bacterial vaccines is not fully recognized, the use of these vaccines in acute diseases has been overlooked. Those who are contending that the immunizing mechanism is stimulated by the toxic materials absorbed from the infected area naturally are reluctant to give vaccines in these cases, fearing that harm might be done by imposing still more toxic material on the body, by the addition of the vaccine, but theory is only valuable when corroborated by practice. Even such a conservative man as Professor J. G. Adami who contends that the toxic materials stimulate the immunizing mechanism says:* "The good results obtained in these cases can no longer be questioned, and what is interesting is that the system evidently benefits from the slight temporary added rise of temperature which shows itself during the six hours or so immediately following the vaccination. . . . Time forbids me to do more than note the curious paradox that often such vaccination converts a disease like typhoid fever, that ordinarily recovers by lysis, into a recovery by crisis, and vice versa time and again causes a disease like pneumonia culminating in crisis into one healing by relatively slow, but favorable lysis."

**Journal A. M. A.*, June 11, 1910, page 1922.

SCARLET FEVER.

The bacteriology of scarlet fever has been very extensively studied. Whether the disease is caused by a streptococcus or some allied organism is still in dispute, but it is now generally admitted that in the severe throat complications of this disease the streptococcus is the pathogenic organism. Naturally, then, the use of streptococcus vaccines in these cases would suggest itself.

On bacteriology of scarlet fever*: "Schleissner found streptococci almost in pure cultures on the tonsils in every case of scarlet fever examined in its incipency before the sore throat had developed. He was also able to cultivate streptococci from the blood in a large proportion of the seventy-three cases reported, and the presence of antibodies was also unmistakable, reaching the maximum about the tenth day. It seems evident that streptococci are closely connected with the scarlet fever process, and hence that antistreptococcus treatment can not fail to aid in attenuating the disease."

My own personal experience is limited to fifteen cases. Three of these were very bad cases with extensive throat complications in the early development and the promptness with which they recovered indicated unmistakable evidence of the value of the vaccine treatment. All these cases recovered without any of the unpleasant results that so often follow this disease. Others using streptococcus vaccine in scarlet fever have been obtaining similar results. From what information I have been

**Journal A. M. A.*, May 29, 1910, review *Wiener Klinische Wochenschrift*, April 15, 1910, page 1803.

able to collect it seems to me that *every case* of scarlet fever should have a dose of streptococcus vaccine as soon as a diagnosis can be made. The course of the disease is thereby unquestionably modified and shortened. In adults the average adult dose of 30,000,000 is given and in children from a quarter to a half of this amount according to age.

Usually in twenty-four hours there is a marked improvement with reduction of temperature. If the improvement continues no more vaccine is necessary. If the temperature rises again two or three days after the first inoculation the dose should be repeated. If no improvement is observed twenty-four hours after the first inoculation the dose should then be repeated.

I have used streptococcus vaccine as a prophylactor in eight children exposed during the entire course of the disease of another member of the family. Of these two contracted the disease in a very mild form. Dr. Ernest E. Irons in speaking of vaccines as prophylactors says*: "The prophylactic use of streptococcus vaccine in scarlet fever is receiving much attention, particularly by Russian physicians, whose statistics appear to show a remarkable immunity to the disease in those who have received the protective vaccines." As a prophylactor the usual adult dose of streptococcus vaccine is given regardless to age and repeated in about eight or ten days.

ERYSIPELAS.

No one now doubts that erysipelas is caused by a streptococcus. Whether it is a streptococcus pyogenes

**Journal A. M. A.*, Nov. 12, 1910, page 1718.

or a special strain, the streptococcus erysipelatis, is still open to discussion. This disease is readily recognized from clinical symptoms, bacterial verifications not being necessary. The organism is not so readily procured as might be expected. The best way to get a culture is to make a small cut through the skin and press out some blood serum from the subcutaneous connective tissue. The inflamed condition of the skin favors the development of staphylococci, and unless great care is taken these organisms will overgrow the streptococci and obscure them.

I have used streptococcus pyogenes vaccines in erysipelas with undoubted beneficial results, but a vaccine made from streptococci obtained from several cases of erysipelas gives better and more uniform results. If given early, material improvement is usually observed by the second day. If no improvement is apparent by this time, another dose should then be given. If there is a decided drop in the temperature, with the pulse and other conditions improving, it is well to withhold the next dose until the temperature rises again. In cases where the temperature does not rise again after it has once gone down, the dose should be repeated three or four days after the first inoculation. In erysipelas 20,000,000 streptococcus erysipelatis, and proportionally smaller amounts for children seems to be a good average dose.

Erysipelas is one of those toxic infections in which the immunizing impression of materials absorbed from the infected area is slow to develop and meantime the

toxic materials frequently predominate. It is for this reason that the vaccine should be given at the very earliest possible moment. If the case has advanced to extreme intoxication uniformly good results could not be expected, but even in these cases spectacular and prompt recoveries have come to my notice after using the vaccine.

LOBAR PNEUMONIA.

Lobar pneumonia, even under the present day methods of treatment, is one of our most fatal diseases. This in itself would seem to be conclusive evidence that the prevalent method of treating this disease is not efficient. The pneumococcus is recognized as the pathogenic factor in this disease, although streptococci are also frequently found to be present. The pneumococcus and streptococcus are closely allied germs, some bacteriologists considering them varieties of the same species. The pneumococcus under the vaccine treatment behaves very much like the streptococcus. The infective process furnishes very toxic materials, while bacterial inoculations of physiological doses of the vaccine are not toxic. The beneficial results from the use of vaccines in treating pneumonia can no longer be questioned.

On this subject Dr. W. H. Watters says*: "Any conclusions that are drawn concerning the value of this form of treatment in pneumonia must be of questionable value unless they are based on the changes from severe illness to comparative comfort and convalescence. . . . It must be said, however, that such favorable alterations

**New England Medical Gazette*, September, 1910, page 410.

occur with pleasing frequency after suitable inoculations and that many of our clinicians believe that not a few apparently hopeless cases have been saved by this method of treatment."

Dr. F. E. Stewart* holds "that the pathologic condition resulting from an acute pneumococcic infection can be relieved, removed or modified by injecting subcutaneously killed bacteria of the species causing the diseased condition."

The adult dose advocated by different observers varies from 20,000,000 to 10,000,000. Those giving small doses advise making inoculations once or twice a day and those using the larger doses recommend daily or every second-day inoculations.

My experience in treating with vaccines dates back to a time before I had a pneumococcus vaccine. Realizing a certain relationship between these organisms, and the fact that in pneumonia, streptococci are also practically invariably present, I used in five successive cases streptococcus vaccine with unfailing good results. Since then I have used pneumococcus vaccine 40,000,000 to the dose and a combination of pneumococcus 30,000,000 and streptococcus 20,000,000 in these cases. I have also supplied both pneumococcus vaccines and the pneumococcus combination extensively to other physicians and aimed to get as much information as possible from the results obtained.

My own experience supplemented by reports obtained by a number of others indicates that the pneumococcus

**Journal A. M. A.*, May, 1910, page 1824.

and streptococcus combination give the best all around results. Since pneumonia is a disease in which toxic materials are extensively absorbed before an immunity is established in its natural course, it is essential that the treatment should be started early to get the best results.

When treatment is started early in the course of the disease a drop in temperature, with other conditions improving, may be confidently looked for within twenty-four hours after the first inoculation. If the temperature rises again after the first drop another dose should be given. Two days after the first inoculation another dose should be given even if there is no rise in temperature. If no material benefit should be observed within the first twenty-four hours after the first inoculation another dose should then be given.

BRONCHO-PNEUMONIA.

The bacterial findings in broncho-pneumonia as shown by repeated sputum examinations are variable. We may find pneumococci, streptococci, staphylococci, influenza bacilli and other organisms. It is not often that one of these organisms is found to the exclusion of the others. Usually there is a mixed infection with the pneumococcus, streptococcus and staphylococcus predominating. We find cases of typical broncho-pneumonia at all seasons of the year, but there are times when the disease is much more prevalent, spreading in epidemics.

In some of these epidemics the pneumococcus predominates, in others the streptococcus is found more fre-

quently and in times when influenza is rife, the influenza bacillus predominates. The staphylococcus is more constant, being found almost invariably. We were very forcibly impressed, by the sputum examinations in our laboratory work, with the prevalence of streptococci in these cases during the winter of 1908-1909 as compared with the number of cases in which the pneumococcus prevailed during the winter of 1909-1910. L. Emmett Holt* reports very extensive bacterial research in bronchial troubles in children and nurses. The results of his work show the pneumococcus, streptococcus and staphylococcus as being the predominating organisms and found more frequently as mixed infections.

With such a variety of pathogenic organisms found in a disease condition it is, of course, impossible to know which one is the essential factor. Naturally the predominating organism would be considered the important factor, but this is not necessarily the case. The virulence of the infecting organism must also be considered. Thus we may have staphylococcus in abundance, and not so many streptococci. In such a case the streptococcus is the greater pathogenic factor because it is a much more virulent organism. The same may be said of the pneumococcus. So in treating broncho-pneumonia with a stock vaccine it is essential to give a vaccine directed against the most important pathogenic organisms usually found. By immunizing against these more virulent organisms, other organisms present will be the more readily disposed of.

**Journal A. M. A.*, Oct. 8, 1910, page 1241.

The fact that the pneumococcus and streptococcus are the most important pathogenic factors in broncho-pneumonia explains why we have been obtaining such uniformly good results with streptococcus and pneumococcus mixed vaccine. Since staphylococci are very often present, and undoubtedly are of some pathogenic significance in broncho-pneumonia, it is well to combine staphylococci, pneumococci and streptococci in treating these cases.

The average adult dose of pneumococci 40,000,000, streptococci 30,000,000 and staphylococci 150,000,000, is sufficient to stimulate the immunizing mechanism, and is not followed by a perceptible toxic or negative phase. Children should be given a quarter to a half of this amount. Marked improvement is usually observed in twenty-four hours after the first inoculation. Should the patient continue to improve the dose should be repeated two or three days after the first inoculation. If the clinical symptoms indicate (by rise of temperature, pulse and other conditions), after a material improvement from the first dose, that the patient is not doing so well, the inoculation should then be repeated. Should no material improvement result from the first inoculation the dose should be repeated the following day.

Not too much should be expected in very severe, far-advanced cases; but even in such cases I have seen unquestionably good results, several apparently hopeless cases recovering. This was particularly noticed in three severe cases of broncho-pneumonia associated with whooping cough.

Broncho-pneumonia being a disease particularly prevalent among infants and children the mode of administering vaccines is of special advantage. A hypodermic injection insures at least that the patient has the required dose and the mother and nurse are relieved of the unpleasant need for giving the baby medicine. The vaccine, being a small dose, often can be injected before the baby is aware of what happened. Usually only two or three doses are required in these cases to effect a cure.

In acute bronchitis we have practically the same bacterial condition that is found in broncho-pneumonia and the infection, being less virulent, can be controlled by inoculations made at longer intervals, preferably from four to six days apart.

OTITIS.

Acute otitis media is not only a very painful disorder, but often leads to deafness and not infrequently the infection extends into the mastoid cells resulting in the more serious mastoiditis. The importance of bringing this infective process rapidly under control with the vaccine treatment can readily be appreciated. The important pathogenic organisms usually found in acute otitis media are streptococci, pneumococci, staphylococci, or a combination of two or more of these organisms. This would naturally be expected because this trouble usually follows an acute infective process of the nasal cavity and pharynx due to invasion by the same organism. Treatment should be started when the characteristic pain in the ear is present. If the vaccine is given early,

often the ear drum may be saved. If there is much bulging of the drum it should be lanced. (Having taken a post-graduate course at the Chicago Polyclinic in Diseases of the eye and ear and attended clinics daily at the Illinois State Eye and Ear Infirmary during the summer 1892 with the intention of making these diseases a speciality, I have had some experience in treating middle ear infections before and after using the vaccine.)

Where there is considerable fever and pain, material improvement will be found twenty-four to thirty-six hours after the first inoculation. The relief from pain in these cases is often very marked within eight to twelve hours.

If there is no marked improvement by this time another dose should be given. Where the ear drum is punctured it will be found that the discharge will dry up in much less time when the vaccine is used. Ordinarily inoculations are made from three to five days apart. A combination of streptococcus, pneumococcus and staphylococcus is best given in these cases.

In some cases of middle ear infections colon bacillus and other organisms are found. In such cases corresponding vaccines should be used. In chronic suppurating ears the streptococci and staphylococci are most frequently found but in many cases we find the bacillus pyocyaneus and colon bacilli. In treating these cases the streptococcus, pneumococcus and staphylococcus combination should be used about once a week and local treatment used at the same time to take care of the

saprophytes and other organisms that may be present.

In cases where the mastoid cells have become involved, more especially among the more ignorant who have neglected matters considering it only an "ear ache," the vaccine treatment often proves efficacious. The same vaccine that is used in the treatment of otitis media will be followed by good results. From the experience I have had I feel confident that where the vaccine treatment is used early in these cases mastoid operations will be rarely called for.

CHAPTER VIII.

CHRONIC "COLDS" AND BRONCHIAL TROUBLES.

Among the commonest ailments met in general practice, those due to or associated with infective processes of the upper respiratory tract respond with much encouragement to vaccine therapy.

Rhinitis, pharyngitis, tonsilitis or "colds" are so commonly met with that almost all of us are expected to be bothered with them part of the time. Some individuals suffer from them frequently and severely, while others are more fortunate and have mild attacks at longer intervals. At best a severe cold is no trivial matter and the general prevalence of "colds" makes their successful treatment an important factor in our daily routine.

In these troubles the streptococcus is quite a constant factor, but pneumococci and staphylococci are also often found. I have used streptococcus vaccine extensively in colds and tonsilitis and also the streptococcus, pneumococcus, staphylococcus combination. From my experience I am satisfied that the streptococcus is the most important pathogenic organism in these colds and next in importance the pneumococcus. These colds may be started by the Friedlander bacillus, the influenza bacillus, the bacillus pyocyaneus or other organisms, but the streptococcus and pneumococcus or both these organisms seem to be the real pathogenic agents. Any physician

who has used these vaccines in the treatment of colds will soon become a convert to this method and especially if he uses them on himself during an attack. In this way he will not only appreciate their therapeutic value but he will also thoroughly realize the harmlessness of these vaccines in acute infections. Inoculations in these cases should be made from two to five days apart. In severe cases of tonsilitis, inoculations may be made at shorter intervals. Streptococcus-staphylococcus combination, streptococcus-pneumococcus combination, or a combination of all three organisms have been successfully used in these cases.

BRONCHITIS.

In subacute and chronic bronchitis, bacterial examinations of the sputum usually show the same organisms that are found in acute bronchitis and broncho-pneumonia — streptococci, pneumococci, staphylococci or a mixed infection of two or more of these organisms. The micrococcus catarrhalis is also often found with one or more of the former organisms. Some cases of chronic bronchitis have been reported ascribed to the influenza bacillus. In our sputum examinations this organism has been conspicuously absent.

Asthma and bronchitis are often closely associated and in these asthmatic cases the same variety of organisms is found that we meet with in bronchitis. E. W. Allen* says: "Careful bacteriologic examinations in over twenty cases of asthma have failed to reveal the con-

**Journal A. M. A.*, Oct. 9, 1909, review *The Lancet*, Sept. 11, 1909.

stant presence of any one particular organism; each case presents a complex picture, most swarm with micro-organisms, and a few have shown within the casts and spirals nothing but short streptococci, and Allen feels that a variety of streptococci is of considerable importance in the production of some of the symptoms of certain cases of severe bronchial asthma."

My experience in treating subacute and chronic bronchitis with vaccines has been quite satisfactory. As a rule good results will be obtained with stock vaccines, marked benefit being observed after the second or third inoculation. In these cases the streptococcus seems to be the most constant pathogenic organism, with the pneumococcus next in importance. Staphylococci and the micrococcus catarrhalis are frequently found but they are not so definitely pathogenic.

With this in mind it will be seen that the best average results are obtained with the streptococcus, pneumococcus, staphylococcus combination vaccine or streptococcus-pneumococcus combination. Where marked beneficial results are not observed after the second or third inoculation a bacterial examination of the sputum should be made. Where unusual organisms exist, and in cases where stock vaccines do not give the desired results, autogenous vaccines should be made. There seems to be no doubt that asthma is caused by these bronchial infections and the results which the vaccine treatment of these cases has secured have been quite gratifying. In subacute and chronic cases inoculations should be made at intervals of from five to seven days.

Chronic catarrh is one of the ailments that is altogether too frequently met with. It would be senseless to contend that vaccines would correct deformities of the nasal cavity or that operative procedures should be dispensed with; but there is no denying the fact that we frequently meet with cases that are bothered with catarrh in which there is no material physical trouble but the individual "catches cold" easily and from frequent attacks becomes a chronic sufferer. The same variety of germs are usually found in catarrh that are found associated with chronic bronchitis—streptococci, pneumococci, staphylococci, micrococcus catarrhalis or various combinations of these organisms. The streptococcus is frequently found in the naso-pharynx, but not so often in the nose here the staphylococcus is most commonly present.

The use of a vaccine of streptococcus combined with staphylococcus gives good results in these cases but the treatment should be continued for several months. Inoculations are given at intervals of five to seven days. The repeated attacks of colds become less and less severe and finally disappear. One characteristic feature of the vaccine treatment in subacute and chronic infections of the respiratory tract is the marked general improvement that is often noticed, before the local infection shows much change.

CHAPTER IX.

TUBERCLE INFECTIONS.

In considering the use of bacterial vaccines in the treatment of tuberculosis it is essential for one to consider other factors besides infection by the *B. tuberculosis per se*. There probably never was a case of pulmonary tuberculosis that terminated fatally in which other pathogenic organisms were not important factors.

The clinical history of tuberculosis often dates from an attack of pneumonia, broncho-pneumonia, bronchitis or a "bad cold" and when we realize that these ailments are caused by the pus group of pathogenic organisms—streptococci, pneumococci, staphylococci—and that these germs are usually found associated with the tubercle bacillus in advanced tuberculosis, the far reaching results of the vaccine treatment as preventatives or prophylactors, as well as curative agents can be better appreciated. In many cases where a dormant tuberculous infection of the lung exists, a broncho-pneumonia, a "bad cold," or a strepto-pneumococcus infection of the air passages, will make conditions favorable for the rapid development of the preexisting tuberculous condition. If in these cases the broncho-pneumonia or cold is promptly taken care of with a combined strepto-pneumo-staphylococcus vaccine, much will have been done to prevent the development of tuberculosis in such cases. On the other hand a retarded recovery of pneumonia, broncho-

pneumonia or bronchitis leaves an excellent soil for the development of pulmonary tuberculosis. In such cases the use of vaccines will go a long way in the prevention of pulmonary tuberculosis. As the case of tuberculosis progresses the growth of these pathogenic organisms always accompanies the tubercle bacillus as found by repeated sputum examinations.

The tubercle bacilli under ordinary conditions are slow growers and frequently connective tissue walls are thrown around them which effectually house them off, but if the pus organisms are present this does not take place because the associated growth of the pus organisms breaks down this connective tissue wall and sets the tubercle bacilli free, thus allowing them to spread out and infect new areas. Furthermore much of the fever, night sweats, cough, excessive expectoration, etc., is due to the pus group of organisms and can be brought under control by vaccine treatment and in this way give the patient a tremendous advantage in the fight which is a hard enough one, no matter how favorable the circumstances.

In treating tuberculosis we have been so much concerned with freeing our patient from the tubercle bacilli and its toxic products that important side infections are often disregarded.

Another important element in successfully handling cases of pulmonary tuberculosis is to have the digestive functions in good condition. We are all aware how a febrile state will impair the appetite, interfere with digestion and cause a general feeling of lassitude and de-

pression, but there is a distinct difference in this regard with a fever caused by the tubercle bacillus and one caused by a coccus infection. When I find a patient running a low temperature without being aware that any fever exists I am always suspicious of tuberculosis, but if we find ever so slight a fever from a coccus infection the patient generally feels quite sick, complains of being feverish, with loss of appetite, and generally expects more fever than the thermometer shows. It is this element of fever, caused by the cocci in mixed infections in tuberculosis, that has the depressing effect in these cases. When the toxic influence of the coccus infections is eliminated with appropriate vaccines, the appetite, digestion and other conditions will correspondingly improve and thus give the patient a better opportunity to overcome the tubercle infection. It has been pointed out before that these vaccines are non-toxic and consequently will do no harm.

In treating tuberculosis, the question of using tubercle vaccine naturally arises. There is an endless variety of opinions among those having large experience in its use with regard to the value of tuberculine in pulmonary tuberculosis. The fundamental reason for this is, no doubt, due to the toxic influence of this remedy.

Unless the dose is very carefully gauged the patient is liable to get too much, resulting in a prolonged negative phase. The consensus of opinion seems to be that if either of the tuberculins T. R. or B. E. is used, very small doses should be employed in the start, from .0001 to .005 of a milligram and the patient carefully watched.

The dose should not be repeated oftener than once in seven or ten days.

If it is desired to give tuberculin it may be given with the other vaccines for the coccus infection, the two not interfering in the least. Open-air treatment and other recognized treatments that are destined to increase the health of the patient will be greatly aided by the vaccines.

BONE TUBERCULOSIS.

In bone and joint tuberculosis where we have sinuses with discharging pus we usually have a mixed infection, the pus organisms being present with the tubercle bacilli. Often these pus organisms are so numerous that they entirely obscure the tubercle bacilli. Treating these with tuberculin or B. E. without giving bacterial vaccines for the other organisms, is of little avail. Bacterial examinations in these cases will show what vaccines are to be used. It is well to start with a small dose and work up as the case progresses, especially so if the complicating organisms happen to be the staphylococci. It goes without saying that if there is dead bone present the wound cannot be expected to heal, but with the use of vaccines the general health will improve, with a reduction of temperature, placing the patient in a better condition for operative procedure, if that should be necessary.

With other tuberculous sinuses resulting from suppurating glands we have practically the same condition concerning mixed infections, and similar treatment should be followed out.

CHAPTER X.

SUCCESS IN RHEUMATIC AFFECTIONS.

That acute articular rheumatism is an infectious disease has been accepted by modern pathologists for twenty years. Bacterial research started with Wilson,* who found micrococci in the pericardial fluid of a case dying of rheumatism. Budzy** found streptococci in the joint fluid from the shoulder joint in a case of acute rheumatism.

Since then, extensive bacterial research has been carried on by Paynton, Payne, Wasserman, Fritz Meyer, Triboulet, Walker and many others, and the fact that the organism causing rheumatism is a coccus is settled; but whether it is the streptococcus pyogenes or a special streptococcus called the "micrococcus rheumaticus" is still under consideration.

The fact that many cases of rheumatism follow an attack of tonsilitis, otitis media or other streptococcus infections is taken as strong evidence in favor of the streptococcus. "Gurich and Schichold† have found supuration in the tonsils almost a constant accompaniment of rheumatic affections. The germs responsible for many cases of articular rheumatism nest in the tonsil pus and pass thence into the blood."

H. Steinert§, in his paper on streptococcus sepsis, says:

**Edinburgh Medical Journal*, June, 1885.

***Orvosi Hetilap*, 1890, Nos. 39-42.

†*Journal A. M. A.*, March 19, 1910, page 1016; review *Munchener medizinische Wochenschrift*, Feb. 8, 1910.

§*Journal A. M. A.*, Oct. 22, 1910, page 1510; extract *Munchener medizinische Wochenschrift*, Sept. 13, 1910.

"The sepsis assumes an acute form as a rule, but in those who have had acute articular rheumatism at any time the sepsis develops in a milder, more chronic form. This suggests that articular rheumatism is a streptococcus disease and modifies the reaction to later streptococcus invasion."

The organism in acute rheumatism is sometimes found in the blood in the early stages. However, I have never succeeded in finding it after making many blood cultures from such cases. To procure germs from inflamed tissue where there is no pus is usually a very difficult matter. Sometimes they are found in the joint fluids; from this it will be observed that to procure the germ from rheumatic patients to make autogenous vaccines is practically impossible. If the inference is correct that the germs causing follicular tonsilitis are also etiologic factors in rheumatic affections, otitis media may also cause rheumatism, and the practical way to procure the germ to make the vaccine is to take it from these sources.

The marvelous results in treating articular rheumatism obtained with streptococcus vaccine thus procured, clearly shows the source of infection and the pathogenic organism in this disease.

From what we know of the etiology of rheumatism it is not to be wondered that conventional treatment has but little influence over the course of this disease. Some still give drugs with the idea that rheumatism is caused by an excess of certain acids. Baths and bakes are usually given with the idea of sweating out the uric acid

and other poisons. A deeper study into these therapeutic measures has led some to believe that heat and baths as applied in institutional practice cause an increased phagocytosis and thus aid in ridding the patient of the infecting germs. Large doses of salicylates given at short intervals are also believed to increase phagocytosis. All these remedies work in an indirect manner and are thus of questionable value. Many a rheumatic is advised to go to a sanatorium because the attending physician wishes to shift the responsibility somewhere else.

The vaccine treatment is direct and from an extensive experience covering over four years, with acute and chronic, mild and severe cases in almost every form, and from what information I have obtained from other physicians to whom I have supplied vaccines, I am confident that a time is very close at hand when streptococcus vaccine will be as generally used in treating rheumatism as diphtheria antitoxin is now used in treating diphtheria.

The clinical symptoms in acute articular rheumatism are generally readily recognized, but sometimes cases are met with that are not so easily classified.

Treatment should be started as early in the course of the disease as circumstances permit, giving 30,000,000 streptococci as the initial adult dose, and children proportionally less. Usually relief from pain and a reduction in temperature will be observed within twenty-four hours after the first inoculation. If the case progresses favorably the dose should be repeated the third or fourth

day and after that from five to seven days apart. I find in order to assure a permanent cure that it is advisable to give two or three doses in these cases after the inflammatory symptoms have disappeared. Occasionally cases are found where this prompt result does not take place with the vaccine treatment. If in these cases a new joint becomes involved the inflammation may be quite severe, but will subside in a few days. Other inflamed joints may follow, but will improve again. I have not seen any of these acute cases confined to bed over a week, that is where treatment was started early. They may run a checkered course, having good and bad days irregularly, but the general condition of the patient is much better than under the salicylate treatment. After a few inoculations the patient regains a good appetite, with an equally good digestion, resulting in a marked improvement in the general health. This is particularly noticeable where the patient's digestive organs have been disturbed by the administration of the salicylates. No special diet is required. Good wholesome food and plenty of it seems to serve very well. In many cases the rheumatic symptoms will entirely disappear after the first or second inoculation. In cases where the inflammatory joint troubles persist in cropping out, an improved general condition of the health with an encouraging desire for food, will be observed before the joint troubles finally disappear.

The heart complications so commonly met with in acute articular rheumatism have been met by the writer only once—in a child six years old, leaving it with a

somewhat crippled heart; but from general appearances it was enjoying perfect health a year after the attack.

The prolonged anemic, debilitated condition so often found during convalescence, following the usual treatment, is not found with the vaccine treatment, and relapses seldom occur after the case has been discharged. If we hope to free humanity from cripples caused by rheumatism, we must cure them before they become chronic. *Streptococcus vaccines* seem to more nearly fulfil this hope than any other agency at present known.

In connection with treatment of acute articular rheumatism I wish to refer especially to four cases that came under my observation because they showed a number of distinctive features:

A young lady with previous good health consulted me concerning a painfully swollen knee. Clinical symptoms were those of acute articular rheumatism with fever and slight effusion into the joint. I gave a dose of *streptococcus vaccine* and confidently expected improvement at least in a few days; but instead the conditions became worse. The dose was repeated the third day, without producing any result. Treatment was continued for four weeks without material improvement and by that time considerable effusion was found in the joint. No other joints became involved. Fever continued during the entire time. I aspirated the joint and found a gram-positive diplococcus. A few colonies grew on Loeffler's blood serum but died before a vaccine could be made. The inflammation gradually subsided and in about three months the knee was well save for a slight stiffness.

I was called to see a middle aged lady who had been suffering with an acute inflammation of all the joints of the right hand and wrist, the hand being very much swollen and painful. She had been under treatment by another physician for four weeks for rheumatism, the temperature varying from 101 to 102½ degrees. Streptococcus vaccine was given for four weeks without marked beneficial results. There were no other joints involved. As a consequence of the prolonged inflammatory process the finger and wrist joints became partially ankylosed. The case consulted some other physician and I am not aware just how it turned out.

A lady having a similarly inflamed hand consulted me. The entire hand and wrist were badly involved. Temperature 102 degrees. One knuckle of the other hand was also affected. The inflammatory process on top of hand was so intense that I felt sure the infecting organism could be procured. After making several small cuts through the skin I pressed out some serum and made cultures on agar blood serum and ascitic agar but no growths were procured. Streptococcus and staphylococcus vaccine were given without results. During the fifth week I detected some fluctuation over the right wrist joint and also over the knuckle of the other hand. After lancing these parts a thin, bloody pus was discharged. Cultures from this grew freely on agar and blood serum. Microscopic examination revealed a gram-positive diplococcus. Inoculations of a vaccine made from this organism resulted in a rapid subsiding of the inflammatory process.

These three cases are interesting because they all gave a clinical picture of acute rheumatism with the exception that the inflammation did not shift to various joints, a joint once involved remained so during the entire course. The bacterial findings in the first and third cases, explains the cause of the negative results with streptococcus vaccine. I have reasons to believe that the diplococcus found in these cases corresponds with the one described by Paynton and Payne.*

The fourth case was a man with a hand giving an identical clinical picture of the last case referred to above, streptococcus vaccine was given in this case without benefit. After procuring the diplococcus vaccine from the previous case some of that was given without results. Meantime, at about the fifth week, some fluctuation was found over the wrist. From a small incision I procured some pus from which I made cultures. A gram-negative diplococcus was found growing on ascitic agar, but not on plain agar or blood serum. Inoculations of a vaccine made from this organism resulted in a prompt recovery. It took some time to break up all the adhesions after the inflammatory process subsided, but the hand is now restored to its former usefulness. A physician who had formerly treated this man told me that he had had gonorrhea a year previous which had apparently been a mild attack and appeared entirely cured.

These cases seem to indicate that streptococcus vaccine is of diagnostic value in acute inflammatory joint

**Progressive Medicine*, March, 1901, page 134.

troubles, especially if the inflammatory process does not shift to different joints.

SUBACUTE RHEUMATISM.

It is difficult to state when a case of rheumatism merges from the acute to the subacute, but when a case has gone along six weeks or more under conventional treatment or no treatment at all, it is well to consider such a case as subacute. The results obtained with streptococcus vaccine in these cases varies. Some respond promptly, while others improve gradually, but if treatment is persistently continued they all get better. I have seen cases recover with one or two inoculations, while others require from ten to twenty-five doses. I generally give the vaccine once a week, after having tried shorter and longer intervals between the doses. I have also used larger and smaller doses, but have settled down to 30,000,000 as a good average dose. In many of these subacute cases the appetite, digestion, and general health improves before much improvement is noticed in the inflamed joints, but after the general health picks up, and the patient gains in weight, the rheumatic condition improves. As in the acute cases, no special dieting is necessary.

CHRONIC RHEUMATISM.

The question of the treatment of chronic rheumatism has received considerable attention, the attitude of many observers being that rheumatism is essentially an acute infective process which tends toward spontaneous recovery and that in those cases where this tendency is not apparent the case should be classified as arthritis

deformans. Since using the serum and vaccine treatment I have had occasion to see a large variety of cases and what has struck me as especially interesting is the varying severity and length of time during which a joint may be involved. Not infrequently cases are met with in which there is joint pain with some tenderness on pressure but not enough discomfort to prevent the moderate use of the joint. Such a condition may last for many months, at times being practically gone, and again reappearing for a while.

That such a condition is a mild form of infection is quite reasonable. Whether it should be classified as chronic rheumatism or as arthritis deformans is not apparent; *but that they get better with the vaccine treatment confirms the opinion that even these mild cases are caused by an infective process.* In cases where acute articular rheumatism is followed by repeated attacks, and recovery is not complete during the intervals it is fairly considered to be "chronic."

The results obtained in treating chronic rheumatism with streptococcus vaccine are very satisfactory when we consider how inadequate the customary forms of treatment are in these cases. Where the inflammatory process has not been severe enough to materially cripple or enlarge the joint the results are good. Some improve steadily after treatment is started, while others improve for a while and then relapse again, but if the treatment is persistently kept up nearly all such cases will get better. Treatment should be continued from two to six months or more if necessary. Where the joints are badly

crippled not so much can be expected, but even in these cases if we can free the joint from the active inflammatory process and relieve suffering, much has been accomplished. It is remarkable, however, how Nature will restore these rheumatic joints as soon as the inflammatory process is disposed of.

In many of these chronic cases not much improvement should be looked for during the first three months. It seems that in chronic infections from repeated auto-inoculation the immunizing apparatus is somewhat worn-out and requires gentle stimulation at quite regular intervals to build it up. From my experience inoculations made one week apart give the best results.

Sometimes it is well to allow patients one or two months' rest from their treatment and then start it over again. I have not found that large doses accomplish more good than the average dose of 30,000,000 streptococci. Where there is much anemia the response to the vaccine treatment is not so good. This holds good in both acute and subacute cases. The average chronic rheumatic has generally gone through so many hardships in the way of treatment, including bakes, baths, rubs, counter irritants, salicylates to saturation, etc., that he thoroughly appreciates the simple inoculation, especially as it constitutes the sole treatment and comes but once a week.

An improved general condition of the health is invariably observed in these cases and is often the first indication of the beneficial effects due to the use of vaccines. Other treatments, especially drugs, often have

an unpleasant tendency to impair the stomach and the general health. No special dieting seems to be necessary. Good wholesome food and plenty of it gives the best results.

ARTHRITIS DEFORMANS.

It is sometimes difficult to make a differential diagnosis between chronic rheumatism and arthritis deformans, but if the following distinguishing characteristics are observed usually a diagnosis can be made. Arthritis deformans generally develops slowly, one joint becoming involved and successively more joints become swollen and enlarged, the onset being gradual and covering a period of months or years. Chronic rheumatism starts with an acute attack with fever, and usually involves in rapid succession various joints or several joints at the same time, and becomes chronic from repeated relapsing of the acute attacks. Arthritis deformans develops persistently, growing from bad to worse over a period of years. Chronic rheumatism develops from repeated acute attacks. Arthritis deformans involves the cartilaginous and bony structure of the joints causing enlargement with limitation of motion, while chronic rheumatism involves more particularly the soft structures surrounding the joint. Arthritis deformans is not extremely painful unless the joint is manipulated or moved. Chronic rheumatics have spells when the joints are very much inflamed and extremely painful. Arthritis at the start more particularly involves the small joints of the hands, chronic rheumatism shows no particular preference of joints.

The etiology of the disease has been discussed from various viewpoints. Some consider that it is a nervous disease, but there seems to be no valid ground for such a contention. The most prevalent idea at present is that the trouble is caused by some irritant circulating in the blood either of metabolic or germ origin. It is difficult to explain why an irritant circulating in the blood should involve one or two joints and leave other joints of the same kind entirely free, especially when we consider that in these cases the cartilages are essentially involved, a structure in which there is very slight circulation. It would seem that a substance that is irritating to joint tissues, circulating in the blood would affect all the joints alike, especially those joints of the same kind. In arthritis deformans this is not the case. One or several joints may be involved, while others are free.

A more reasonable hypothesis is that there is a subdued infective process going on in the joint tissues. No germs have been found so far, but any one who has attempted to procure germs from infected tissues that have not actually broken down can readily realize how easily infections may exist without our being able to find the infecting organism.

What interests the practitioner most, however, is what can be done with these cases. Conventional treatments admittedly are of practically no value, the cases usually going from bad to worse. Hot baths, sweats, massage and similar treatments not only do no good but seem in some cases to do harm.

When I first began to use streptococcus vaccine in

rheumatism, I also used it in several cases of arthritis deformans. Not noticing any actual benefit from the first few treatments, I abandoned the cases. My brother, Dr. A. T. Sherman of Detroit was, fortunately, more persistent and began treating these patients with alternate streptococcus and staphylococcus injections, and kept it up for months. After treating them from three to six months he found that there would be an improvement. During the last two and a half years I have used streptococcus and staphylococcus alternately at weekly intervals in vals in some cases, and in others I used the mixed streptococcus and staphylococcus vaccine. At the present time I am unable to say which method gives the best results.

From what information I can collect from my own cases and from those of other physicians whom I have been supplying with vaccines I can confidently say that in all cases which have not been of too long standing and bedridden, the results have been good. In cases of only a few years standing the progress of the disease is not only stayed, but the swollen and inflamed condition of the joints will subside. Where the joints are much deformed and ankylosed not much benefit should be looked for, save that the patient may be relieved from pain.

Some patients will show improvement after the second or third dose but usually not much benefit is noticed for two or three months. The first benefits are evidenced by an improvement in the general health, associated with a good appetite and an equally good diges-

tion. When this condition is reached the pain and swelling in the joints begin to gradually diminish. There may be spells when the joint conditions get worse for a few days, but this soon subsides again.

Where the disease has not progressed enough to materially cripple the joints uniformly good results may be looked for. After the inflammatory condition subsides, joints that are partly ankylosed will materially limber up with the aid of massage and exercise. When we consider how hopeless these cases are with the ordinary methods of treatment, any material improvement, even though it may require a year of treatment, is well worthy of serious consideration.

CHAPTER XI.

THE TREATMENT OF WOUND INFECTIONS.

The vaccine treatment is a very important factor in the treatment of infected abrasions of the skin and penetrating wounds. Many a person has lost a limb or his life as a consequence of a slight local infection that was not brought under control. In these cases it is essential that the vaccine treatment be started early, because in delay there often is danger.

Naturally the question as to what vaccine should be used comes up. In this connection we should keep in mind the most probable dangerous organism, the streptococcus and also the more probable but less dangerous staphylococcus. We must also not lose sight of a possible tetanus infection. In many of these cases the infecting organism can be found by making a bacterial examination, but in the case of a penetrating wound such as that caused by tramping on a nail, the infection is often carried deep into the tissues and can not be reached to procure a culture for bacterial examination.

Bacterial examinations in these cases are always desirable, but ordinarily a diagnosis made from clinical symptoms is sufficient for the successful administration of a vaccine. Infections that spread rapidly, and especially if the inflammation runs along lymphatic channels leaving red chains, can safely be considered streptococcic. Staphylococcus infections are more closely confined to

the point of infection and spread much more slowly.

Tetanus infections cause little or no local disturbance and it is for this reason that infections with this organism are so often disregarded. I have in mind a case of tetanus in which the point of infection could not be found. The patient nearly died but finally recovered after having received fourteen doses of antitetanic serum. When a wound is much inflamed it is not liable to be tetanic but is either a streptococcic or staphylococcic infection or, what is far more common, an infection due to both organisms. So it would seem that the most practical thing to do is to give the patient a dose of streptococcus-staphylococcus combination at once. Do not wait for a bacterial examination. Do not delay treatment for an autogenous vaccine. The earlier treatment is started the better results are assured. By treating these cases in this manner I have had the most happy results. Streptococcus and staphylococcus infections are met with so frequently, and so often lead to serious consequences if not checked at once with vaccines, that every physician should be continually armed with this most potent weapon in combating these infections.

PUERPERAL FEVER.

Puerperal fever is, strictly speaking, the result of a wound infection, and is such a serious affair that it never should be considered lightly. The infection in these cases is always local before it becomes general and it is impossible to say just when the systemic infection starts. In some cases the process is much more rapid than in others. In the early stages the diagnosis is al-

ways more or less obscure. Some fever and more or less pain during the puerperal state may arise from many causes but any obstetrician looks with apprehension at a rise of temperature, especially if associated with a rapid pulse, lassitude and depression, fearing that he has a streptococcus infection to contend with.

From an anatomical standpoint one could hardly imagine a more favorable condition for a serious infection, than the womb presents after confinement. The size of the organ affords much tissue for infection and in the process of undergoing subinvolution the tissue has a lowered vitality making it more susceptible to infection. The uterine cavity presents a large excoriated surface from the placental attachment, with numerous folds of the mucous lining, in which the infection may be located. Local treatment at best is difficult to carry out and of questionable value.

Dr. J. H. Carstens in referring to this subject says* "The point I want to make is simply this, that by local treatment more harm is often done than good. Douches given by ignorant persons often implant new virulent micro-organisms within the genital tract, while scraping and curetting and injuring the delicate mucous membrane opens new channels for absorption. . . . I have been all the more desirous of bringing this view before our section since reading the proceedings of the last German Association of Obstetricians, where Winter, in an exhaustive article, shows this most clearly, coming to the conclusion that simple absorption ceases as soon as the

**Journal A. M. A.*, Aug. 6, 1910, page 476.

necrotic tissue is cast off; that simple local infection and endometritis stops soon without any treatment; that no local treatment will prevent deep or general infection, and that when absorption takes place there are remnants of tissue still in the uterus, one should be tardy about removing them, as these are generally quickly cast off and the patient gets along just as well as with the most vigorous treatment."

If the infection has extended into the uterine tissue it can not be reached by any local treatment. It necessarily follows under such conditions that unless the systemic resistance against the infection is sufficient to retard its progress, our case is hopeless. Naturally our first duty in these cases is to raise the immunizing powers against the invading organism. In bacterial vaccines we have an efficient remedy for this purpose, especially if it is used before the infection becomes general.

Time being by far the most important factor, treatment should not be delayed to make bacterial examinations or autogenous vaccines. The probable infecting organism of serious consequence is the streptococcus, and consequently streptococcus vaccine should be given at once, just as we give diphtheria antitoxin in suspected cases of diphtheria, thereby giving the patient the benefit of the doubt.

Realizing that staphylococci may also be present there is no reason why we should not use a mixed streptococcus and staphylococcus vaccine in these cases. In cases where there is a foul odor to the discharge, colon bacilli are usually found to be an important factor in the in-

fective process. In such cases a combination streptococcus and colon bacillus vaccine should be used. Where facilities are at hand a bacterial examination can be made to verify the diagnosis. A culture is readily made by inserting a speculum, cleaning the os, then inserting a small sterile swab into the womb. With this swab culture tubes may be inoculated.

In my opinion all puerperal cases that show a temperature of 100 degrees or more a few days after confinement should have a dose of vaccine. In this way serious trouble will often be avoided. Such a procedure usually causes the temperature to drop within twenty-four hours. In such cases the dose should be repeated two or three days after the first inoculation or sooner if the temperature rises again. If no improvement is noticed within twenty-four hours after the first inoculation, the dose should then be repeated. The average adult dose is given in these cases. The vaccines used are nontoxic and harmless when used with ordinary discretion. From my own experience and from information I have obtained from many other physicians who have treated puerperal infections similarly, I can with all confidence most heartily recommend this mode of treatment as a routine. Any local or other treatment that might be desirable to employ will not interfere with the vaccines in the least.

CHAPTER XII.

APPENDICITIS.

The vermiform appendix seems to be a favored organ for infections, probably because of its peculiar construction and the fact that it is a rudimentary organ. Infections of this organ are always more or less serious because the close proximity to the peritoneal cavity is so liable to produce a peritonitis. It is impossible to make a bacterial examination to determine the infecting organism, but we have learned that colon bacilli are nearly always present. If streptococci should be present the dangers of an imminent streptococcus peritonitis are apparent. Whether the case is to be operated on or not, to immunize against these organisms is no doubt an advantage to the patient. In the early acute stage where there is much pain and tenderness with fever I have seen almost invariably marked improvement within twenty-four hours after the first inoculation of a combination of streptococcus 30,000,000 and colon bacillus 40,000,000. With the intense acute inflammatory process subdued, the condition for operation is better should such procedure be desired.

The eleven cases that I personally treated with vaccines all made a rapid recovery and all except one have remained well. In this case some tenderness remained over the appendix, although all other symptoms had disappeared. I recommended an operation and the ap-

pendix was removed with a resulting rapid recovery. In addition to the vaccine I always employ absolute rest, an icebag over the inflamed area and absolutely no food.

It may be argued that the beneficial results were mainly obtained from the icebag, rest and no food. In reply to that I can only say that I used the latter treatment for ten years before I used the vaccines, and that the prompt and decisive results that are obtained with the vaccine treatment, were noticeably absent. Try it and convince yourself. In acute cases the dose should be repeated in two or three days and in subacute cases at five-day intervals.

CHAPTER XIII.

URINARY INFECTIONS.

Nonspecific infections of the urinary tract furnish a good field for vaccine treatment. Here the colon bacillus is the most frequent pathogenic organism found. Staphylococci, streptococci, diplococci and pneumococci are also found. An interesting feature of these cases is that we often find germs in the urine when from a chemical standpoint the urine is normal. In cases of nephritis with albumin, we have never failed to find some pathogenic organism in the urine. In cystitis and pyelonephritis the colon bacilli are usually found in large numbers. In some of these cases staphylococci and other organisms are also found with the colon bacillus. Bacterial examination of the urine should be made to determine what organism is present.

The best way to procure the urine free from outside contamination is to use a catheter and have it pass directly into a previously sterilized vial provided with a sterile cork, care being taken that the catheter is sterile and the parts thoroughly cleansed before catheterizing. The urine should then be centrifuged and cultures and slides made from the precipitate. Such bacterial examinations of the urine are very important because they often reveal troubles where the chemical analysis gives negative results, and in cases of albuminuria it may often give a clue as to the cause of the nephritis. Ob-

scure troubles are sometimes unravelled in this way and cured.

It may be well to mention a few that came under my observation :

A young man with previous good health complained of not feeling well. He had been gradually losing in weight and readily felt tired. Had no local pain and no urinary symptoms, slept and ate well but did not seem to relish his food as formerly. Chemical analysis of the urine showed nothing abnormal. Bacterial examination revealed staphylococci. Six doses of staphylococcus aureus and albus stock vaccine, starting with 100,000,000 at a dose and increasing to 300,000,000 completely restored his health.

A lady of middle age complained of pain in her knees and back and a general lassitude, want of vigor, and depression. This condition had lasted almost constantly for three years. The pain in her knees was considered rheumatic but otherwise there was no physical evidence of ill health. She had been treated by several doctors and had taken treatment and baths in a sanitarium. She informed me that examinations of the urine had been made and it was found normal. I procured some urine and found no albumen, casts or sugar but, strangely enough, a bacterial examination showed pneumococci and colon bacilli. A stock vaccine consisting of colon bacilli, pneumococci and streptococci was given once a week. The streptococci were included for the rheumatic condition of the knees. She began to improve after the fourth inoculation and after fifteen inoculations is

restored to her former health with the exception of some pain in her knees for which she is still receiving treatment.

A lady of previous good health consulted me concerning frequent urination during the night. She would sleep a short time then awaken with a pain in the head and a desire to void her urine. This would happen from eight to twelve times during the night. During the day she was not troubled so much. There were no evidences of urinary calculi; the urine was normal in quantity during the twenty-four hours, and a chemical examination showed nothing abnormal and there was little sediment. A bacterial examination revealed colon bacilli.

A stock vaccine was given at first but she was very sensitive to the vaccine and it produced considerable local irritation. An autogenous vaccine was made from organisms isolated from her urine and treatment was started with this vaccine. 20,000,000 of dead organisms were given the first dose. Quite a local irritation was produced, and the dose was not repeated for two weeks. Inoculations were then continued for eight weeks, the dose being gradually increased to 80,000,000 at which time her trouble had entirely ceased. About eight months later she noticed a return of the symptoms and I began to inoculate her again with the same vaccine. She still showed a low resistance to the colon bacilli as evidenced by the amount of inflammation produced where the inoculation was made. I have now given her six inoculations and she is again restored to health. I shall, how-

ever, continue the treatments for two or three months more and thereby build her immunizing power up against the colon bacillus so that the results may be permanent.

I am now treating a patient that was suffering with what promised to be a hopeless case of nephritis of eight months' standing with extensive dropsical effusion. *Staphylococcus aureus* was isolated from the urine, which was about 40 per cent albumin. A few stock vaccines were given while an autogenous one was being prepared. Sweats and a vegetarian diet were ordered to relieve the kidneys of as much work as possible. After six inoculations of the autogenous vaccine, at weekly intervals, starting with 100,000,000 and increasing to 250,000,000, the albumen has decreased to one-fifth of what it formerly was, with other conditions of the patient improving.

In cases where there is no evidence of kidney or bladder trouble the question arises, where do these germs come from? Do the kidneys eliminate germs from infections in some other part of the body or are they lingering and developed in the urinary tract. Dodge* claims that the kidneys eliminate germs from infection in distant parts of the body, and he has used vaccines in these cases with good results.

In obscure ailments a bacterial examination of the urine should always be made, for in this way troubles may be found and successfully treated that otherwise could not be brought under control.

**Journal Michigan State Medical Society*, February, 1910.

CHAPTER XIV.

THE VACCINE TREATMENT OF GONORRHEAL INFECTIONS.

Gonococcus vaccine is being much more commonly used in treating gonorrheal infections, showing an increasing confidence in its therapeutic value. From various sources of information it seems that varying results are being obtained, some being enthusiastic about its value, while others think that no material benefit is derived. This depends on the viewpoint of the individual user and the kind of cases the vaccine was used in. If we expect to cure acute gonorrhea or old chronic cases, *in which other accompanying infections are ignored*, with a few inoculations of a gonococcus vaccine, disappointment must be expected.

The value of a vaccine depends on its specific influence in increasing the phagocytic power of the blood, thus hastening the establishment of an immunity, and naturally it will act more promptly where the infection is of such a nature that the blood comes thoroughly in contact with the germs. This is nicely illustrated by the fact that the various types of acute gonorrhea, deep seated infections, orchitis, epididymitis, swollen lymphatic glands, etc., respond much more promptly than the superficial infections. In these cases marked improvement is usually found in twenty-four hours after the first inoculation and in three or four days the pain and swelling will be well under control.

The following case reported by Jamison* illustrates this point very well.

"Mexican, aged twenty-three, married, clerk, came to me on October 4, 1909, complaining of swelling of the left epididymis and testicle. He had contracted a gonorrhea in 1906, which lasted for two months. It again appeared four or five months afterward, but only lasted a short time. Since then he has had a slight discharge from time to time.

"Examination showed the left testicle and epididymis to be swollen to the size of a small orange, tender, and very painful. The pain and tenderness extended up the cord as far as the internal ring. Temperature 102 degrees.

"Having no vaccine at hand I painted the scrotum with guaiacol, supported the testicle, and ordered a purge and rest in bed. Two days later he came back saying that the pain was not relieved and that the swelling was increased. I gave him 15,000,000 of vaccine. On the 8th the pain was less, the temperature normal, and he felt better generally. Injected 25,000,000. On the 10th he received 50,000,000. Two days later he reported that the pain was entirely gone and the swelling was reduced by one-half. Fifty millions more were given, and on the 18th, when I saw him again, the testicle was normal, there was no induration of the epididymis, nor tenderness on handling. There was no discharge from the meatus. The first urine was clear and contained

**Therapeutic Gazette*, May, 1910, page 313.

one small mucoid thread; the second was entirely clear.

"The striking points of this case are: (1) Absence of pain at the site of injection. (2) Rapid diminution and disappearance of the pain in epididymis, testicle, and cord. (3) Rapid resolution. (4) Rapid fall in temperature. Pain at the site of the injection I have found in every case in which the dose was too large, and, moreover, it seemed to be in direct ratio to the toxicity of the dose. In other words, the more pronounced the negative phase, the greater the pain at the site of injection. If the dose is too large it is sometimes followed by increase of pain in the affected part and elevation of temperature. Excessive intoxication may cause a fall in temperature, and a rise may follow the immunizing process."

B. Wallis Hamilton* after an extensive use of stock vaccines in vulvovaginitis in children concludes that: "Vaccine therapy has a place in the treatment of this infection in little children for the following reasons:

"1. The short time required for a cure in over 85 per cent of cases.

"2. The ease of administration of the vaccine; no special apparatus or knowledge of technic being necessary.

"3. The vaccine is apparently harmless when used under aseptic precautions.

"4. It is not necessary to take the opsonic index, with its complicated technic.

**Journal A. M. A.*, April 9, 1910 page 1198.

"5. It eliminates irrigations, which direct the child's attention to its genitals, at times encouraging precocious masturbation. The frequent douches necessary in the irrigation treatment will, with the best of care and gentleness, produce some injury when continued over a long period of time."

Many physicians regard local treatment in the early stages of an acute gonorrhea as not advisable because thereby the infection may be carried back into deeper structures, thus complicating conditions. After a sufficient lapse of time for Nature to establish a certain amount of immunity the danger of spreading the infection by local treatment is not so great. By using gonococcus vaccine in these acute cases this condition of immunity will be very materially increased and hastened and the development of deep-seated infections will be avoided. Within a few days the discharge will also be materially improved.

The inoculations should be made at intervals of from two to five days and continued until the case is well under control and at one week intervals after that. After the second or third inoculation the generally recognized local treatments should be applied to take care of the superficial infection. It is well to start with a dose of 10,000,000 and if the case progresses favorably, the same may be continued. In stubborn cases the dose may be increased to 50 or 100 million. If the patient has not developed much resistance against the gonococcus these larger doses may cause considerable irritation or inflam-

mation where the inoculation was made. For this reason it is preferable to start with the smaller, and work up to the larger dose if necessary.

CHRONIC GONORRHEA.

When gonococcus vaccine first came into use many physicians tried it first on old chronic cases and if they did not get results at once concluded that bacterial vaccines were of no use, never realizing that these cases are nearly always mixed infections the staphylococcus being the accompanying infection. To give gonococcus vaccine in these cases and not take care of the staphylococcus albus infection as well, is of little or no avail. Dr. Robertson* is of the opinion that in prostatic infections after gonorrhea the staphylococcus albus is the real pathogenic organism, coming in as a secondary infection after the gonococcus has paved the way. The results obtained in his reported cases treated with staphylococcus albus vaccine certainly show that his contentions are well grounded. He gives staphylococcus albus vaccine in 400,000,000 doses every other day for three successive inoculations and thereafter once a week until the case is cured; generally recognized local treatment is also employed at the same time.

Good results are also being obtained with a combination of gonococcus and staphylococcus albus vaccine in chronic gonorrhea. In treating these cases the necessity of taking care of the surface infection with the usual local treatment should be borne in mind; the vaccine be-

**Journal A. M. A.*, Sept. 4, 1909, page 797.

ing used to get rid of the germs located deeper in the tissues which the local treatment does not reach.

The dose in these cases will vary from 25 to 100 millions of gonococcus combined with 100 to 400 millions of staphylococcus albus vaccine, repeated at intervals of from five to seven days.

GONORRHEAL RHEUMATISM.

Gonococcus vaccine is now regarded as the most efficient remedy in the treating of gonorrheal rheumatism. In discussing this subject B. A. Thomas* says: "I myself have observed almost incredible results in gonorrheal arthritis treated by bacterial vaccines. Moreover; the usefulness of vaccines in acute conditions, even in blennorrhea, according to Cole and Meakins—although I have had no experience in this respect—gives it, in my opinion, superiority over serum as a therapeutic measure."

In these cases it is not always an easy matter to determine whether we have a case of gonorrheal or ordinary rheumatism to deal with. If a man has rheumatism who has had gonorrhea it does not necessarily follow that that is gonorrheal rheumatism. Where the diagnosis is clear the results in treating gonorrheal rheumatism with gonococcus vaccine are uniformly good. Where the diagnosis is doubtful the vaccine treatment will often aid in clearing the matter up. If no improvement is noticed after a few inoculations of gonococcus vaccine the case is not liable to be gonorrheal. If the streptococcus vaccine is resorted to and the case clears

**Journal A. M. A.*, Jan. 22, 1910, page 2548.

up the diagnosis is clear. Treatment should be started with 20,000,000 to a dose of gonococcus vaccine, the inoculations being made at intervals of five to seven days. If little inflammatory reaction is produced at the point of inoculation the dose should be increased to 50,000,000 or 100,000,000 organisms or more. Where no marked improvement is observed after the third or fourth inoculation the case should be treated with streptococcus vaccine as a case of ordinary rheumatism.

CHAPTER XV.

THE USE OF TYPHOID VACCINE.

The beneficial effects of typhoid vaccine as a prophylactor in typhoid fever epidemics can no longer be questioned. The results obtained in the army service of this country and abroad are quite conclusive. Vaccinated cases do not often contract the disease and if they do, the course of the disease is usually mild. From the beneficial results so far obtained it seems that where there is a case of typhoid fever every member of the family should be immunized. The procedure is harmless and usually causes little or no disturbance. Russell* sums up his conclusions as follows:

"1. Vaccination against typhoid undoubtedly protects to a very great degree against the disease.

"2. It is an indispensable adjunct to other prophylaxis among troops and others exposed to infection.

"3. It is very doubtful if there is an increase of susceptibility following inoculation.

"4. Vaccination during the disease, for therapeutic purposes, fails to reveal any evidence of a negative phase.

"5. The statement that vaccination should not be carried out in the presence of an epidemic is not justified by the facts at hand.

**Bulletin of the Johns Hopkins Hospital*, March, 1910.

"6. The procedure is easily carried out, and only exceptionally does it provoke severe general reactions.

"7. No untoward results have occurred in this series of 6340 vaccinations."

Typhoid vaccine is also being successfully used in treating typhoid fever. I will quote somewhat at length upon this subject from W. H. Watters.*

"At our laboratories in Boston and at our hospital we began several years ago the first routine test of the treatment that was ever employed, at least to our present knowledge. In a recapitulation of the results made for the annual report we have compared our figures with those of patients in the same institution at the same time with like care and attention, but without vaccines. The figures are as follows:

	Treated, 36 cases.	Untreated, 70 cases.
Average duration of fever (days).....	16	25
Average residence in hospital (days)..<	39	56
Percentage of recrudescences.....	9	24

"No patient has been injured in any clinical manner, and if further statistics of later years are equally satisfactory but one conclusion is inevitable."

The dose for immunizing is 500,000,000 of killed bacilli for the first dose and about ten days later 1,000,000,000 should be given.

For therapeutic purposes in cases of typhoid fever the dose varies from 25,000,000 to 100,000,000 and some give even larger doses. It seems from what informa-

**New England Medical Gazette*, September, 1910, page 411.

tion is available that 50,000,000 given at intervals of from two to three days give the best average results.

Under the title "Antityphoid Inoculation in General Practice," a splendid editorial recently appeared*, which is worthy of repetition here:

"For more than seventeen years the matter of the use of bacterial products in the treatment of typhoid fever has been under discussion. Since Fraenkel's first article in 1893 hundreds of articles and reports have appeared, and today the fact stands out in bold relief that in the biologic preparations of the bacillus typhosus, and more especially the typhoid vaccine, we have a therapeutic agent of unquestionable merit.

"Since typhoid fever is an epidemic disease and such a common scourge during war, much of the investigative effort has been accomplished under the supervision of several governments and health burcaus. The immense amount of statistics which have resulted ought surely to be enough to convince the most confirmed skeptic.

"To put the facts as briefly as possible prophylactic inoculations of typhoid vaccine have made a noticeable difference in both the incidence of the disease and its mortality. Not only may typhoid inoculations be used as a prophylactic measure, but also in the actual treatment of the disease. Manifestly there has been no opportunity to collect the thousands upon thousands of reports that are to be found in the literature on the prophy-

**Amer. Jour. Physiologic Therapeutics*, January, 1911, pages 256-258.

lactic use of this remedy; but results in hundreds of cases should serve at least to stimulate an interest among the rank and file of the profession in the most sensible remedial agent we have in the treatment of typhoid infections.

"On this subject Allen writes as follows: 'I will say, however, in the light of my experience, that were I now entering upon another three months' service I would unhesitatingly give every case the benefit of the opsonic treatment at once, administering no other remedy until it was demonstrated that the case did not respond. As I watched the progress of these cases I found myself relying more and more upon this new method. It was a very unique and interesting phenomenon to me to see repeatedly apparently serious cases of typhoid fever, presenting all the usual symptoms, rapidly overcome them and in a few days change the whole complexion of their illness for the better, going on to a rapid convalescence. After but one treatment some of them began immediately to improve in every respect. The fever became less, the headache and backache disappeared, the tongue cleared up and they began to complain of hunger. Most of them would say, if asked, that they felt better and that, also, very soon after the initial treatment. About 75 per cent of all the cases were favorably influenced.

"Only one other point requires mentioning, and that is the influence of typhoid inoculations upon "typhoid carriers." Many an individual is a walking menace to the community, and anything that might be used to relieve them from this chronic infection and at the same

time preclude the possibility of continually reinfecting their associates, would, without a doubt, be a Godsend. The amount of work done along this line is decidedly limited. Typhoid carriers are, fortunately, not so very common, or, unfortunately, not so easily detected; but one or two cases worked out and reported ought to be sufficient to base statements upon. Houston, writing in the *British Medical Journal*, reports his observations on three cases, one of which is both interesting and encouraging. He gave the patient doses of 50,000,000, 100,000,000, 200,000,000, 300,000,000, 500,000,000, and 1,000,000,000 bacilli, progressively increasing at intervals of three weeks. During this time the weight returned to normal and the health, which had not been good since the attack of typhoid fever, two years before, was completely restored. At the same time the typhoid bacilli disappeared from the stools and from the urine.

“To sum up the typhoid vaccine is a potent prophylactor and therapeutic agent. The only reason, as we see it, that it is not more universally used is that *the majority do not know of its virtue*; it therefore becomes our duty to disseminate information which we believe carries with it immense possibilities for individual and communal good.”

CHAPTER XVI.

VACCINES IN DERMATOLOGY.

In no class of diseases has the use of vaccines been as thoroughly effective as in the various dermatoses. More work has been done in this special line than in all the others combined, and this has been undoubtedly due to the fact that infections of the skin are so common and the infective organism so easily procured.

Dr. T. Caspar Gilchrist relates the results of his experience with the use of vaccines in the treatment of cutaneous diseases at the Johns Hopkins Dispensary and in private practice during the last three and one-half years.* Over 300 cases had been treated. As far as vaccine therapy was concerned in the treatment of cutaneous affections, Dr. Gilchrist said his experience might be summarized as follows: He had found it to be a distinctly valuable adjunct to our therapeutics. The staphylococcus albus vaccine was of undoubted value in the treatment of all pustular affections of the skin, but especially, in his experience, in the treatment of relapsing furunculosis, staphylococcic dermatitis, sycosis-non-parastica, in certain forms of eczema, in pustular rosacea, and in acne when the disease was largely secondarily infected with the staphylococcus albus. He had also found the vaccines to be of value in the treatment of erythema multiforme, especially of the relapsing bul-

**Medical Record*, Oct. 15, 1910.

lous type, and in rosacea where the flushings were decreased by the vaccine therapy. It was also helpful in dermatitis herpetiformis and pityriasis rosea, so much so that he would recommend vaccine therapy to be tried when the disease did not yield to the usual method of treatment. Bacillus acne vaccine he had found to be of great value, especially in the treatment of those chronic nodular relapsing types of acne vulgaris, and it has proved to be in his hands in a great many cases a curative agent.

ACNE.

The results obtained in treating acne with stock staphylococcus vaccine are generally satisfactory. The best results are obtained in cases that are not of too long standing. Where there is much indurated hard tissue resulting from many years' inflammation, the results are slow and not much improvement is to be expected during the first few months' treatment. If these cases do not respond to three or four doses of stock vaccines, an autogenous vaccine should be made and treatment continued.

In acne it is well to start with a small average dose of 100,000,000 and work up to 300,000,000 or more. Inoculations should be made from five to seven days apart.

ECZEMA.

In six successive cases of acute and subacute eczema very prompt relief was obtained with staphylococcus albus and aureus vaccine 200,000,000 each, given at six-day intervals. Very material improvement was obtained in every patient after the first inoculation. They all re-

covered, six doses being the most any of them required.

I have used staphylococcus vaccine in five cases of chronic eczema. Two were very much improved, the local condition being practically healed. In two there was no improvement and in the other case the general health was much improved but the local condition was not much benefited.

FURUNCULOSIS.

The vaccine treatment is now regarded as the classical method of treating furunculosis. The infecting organisms predominating in these cases are staphylococcus albus and staphylococcus aureus. A mixed staphylococcus aureus and albus vaccine should be employed, starting with an average dose of 100,000,000 each and then work up to 200,000,000 or 300,000,000. Inoculations are given at the usual average interval — from five to seven days apart. If treatment is started before suppuration has taken place the inflammation usually subsides without pus formation. If the tissues have begun to break down the process will be arrested, the hard indurated condition around the necrotic center will soften and the pus formation will be thin and found near the surface. After the pus is evacuated the furuncle heals rapidly.

Carbuncles should always be treated with staphylococcus vaccine. When used early the infective process will be aborted. In these carbuncles the association of pain with a low immunizing power is well illustrated. One of the first symptoms of improvement after giving the vaccine is that the pain and throbbing in the carbuncle

diminishes notably. Ross cites a case*: "The patient was a laborer of 45 who had a carbuncle on his back as large as a baby's fist. Inoculation with 300,000,000 staphylococci removed all pain and tenderness in forty-eight hours, the central slough came away in eight days and almost all of the inflammatory mass was dissipated a week later."

**Journal A. M. A.*, Oct. 12, 1907, page 1246.

CHAPTER XVII.

EYE INFECTIONS.

Infections of the eye are very common and quite naturally the same pathogenic organisms that cause most of the troubles in other parts of the body are found here.

In corneal ulcers we usually find staphylococci. In one case of virulent corneal infection, following a corneal abrasion from emery grindings, I found almost a pure culture of streptococci.

The treatment of corneal infections with vaccines presents a somewhat difficult problem because the cornea has no direct blood supply; but when we consider that in many of these cases the inflammation extends to other parts of the eye causing considerable swelling and pain the advantage of the vaccine treatment will be observed.

In so-called "rheumatic iritis" we have a disease condition that is not only very painful and distressing but, under conventional treatment, very hard to manage. What is true of the iris applies equally to inflammations of the ciliary bodies. That the streptococcus is the infecting organism in these cases is apparent from the excellent results obtained with streptococcus vaccine.

Recently a case of iritis came under my care that had been treated for nearly a week by another physician. He had been using atropine until the pupil was fairly well dilated considering the swollen condition of the iris. The eye was very painful and inflamed. The conjunctiva

was deep red and much swollen. The swelling also extended to the orbit, even causing the side of the face to be swollen. The atropine was continued and in addition I gave the patient one dose of 30,000,000 streptococcus vaccine. The patient told me that in eight hours after the inoculation she began to get relief from the pain and continued to improve. Five days later when I gave her the second dose the swelling and pain was gone, but some redness over the sclera remained. The atropine was discontinued and the inoculations of streptococcus vaccine were kept up at weekly intervals, four doses being given in all. She made a complete recovery.

I use streptococcus vaccine as a routine in all cases of iritis if there is no history of syphilis. The results have been uniformly good.

In injuries to the eye I think it is good practice to give streptococcus-staphylococcus combination vaccine to protect the patient from infections by these organisms.

In corneal ulcers unquestionable benefit is derived from staphylococcus aureus and albus vaccine or streptococcus and staphylococcus combination vaccine.

Dr. W. A. Mann of Chicago in a personal communication gives the following interesting experiences:

VACCINES IN EYE DISEASES.

I began using vaccines in my work without taking the opsonic index with a view of determining by clinical results if such procedure could be done with satisfactory results. In some of my cases the germ of infection could not be isolated, and the vaccine used was based on laboratory examinations of similar cases by pathol-

ogists. In some cases it was guesswork and based on the theory of rheumatic diathesis as a cause, and that streptococcus was a possible factor in rheumatism. Injections were given subcutaneously, and repeated in five to seven days. Thirty million was the dose of streptococcus and 100,000,000 of staphylococcus.

Phlyctenular Corneal Ulcers.—Case 1. Miss B. An ulcer with relapses. Had a suppurative chalazion, blepharitis marginalis, pyorrhœa alveolaris and acne. Mixed staphylococcus (aureus, citreus and albus, 100,000,000 each) vaccine was given, she getting three doses at intervals of one week. The ulcer promptly healed and the acne and pyorrhœa alveolaris were much improved.

Case 2. Miss C. B. Healing irritable ulcer, severe acne, mixed staphylococcus and later staphylococcus albus. Ulcer healed slowly. Acne, marked improvement after first injection. Cured after five injections.

Corneal Ulcers.—Case 1. Mr. L. Traumatic infection about five years ago, leaving scar which had broken down and been curetted one year ago. Present attack has been most stubborn, and after two curetings has not entirely healed. Staphylococcus mixed and third curetting brought about healing.

Case 2. Mrs. C. Been treated by me in two former attacks. Ulcers have lasted from two to four weeks. Third attack looked as if it would be as serious as former ones. Was curetted and staphylococcus mixed given. Ulcer was healed on fourth day.

Case 3. Mrs. A. Large ulcer, three weeks. Improved twenty-four hours after staphylococcus injection and having progressed nicely.

Iritis.—Case 1. D. W. A. December, 1908. Severe iritis left; anterior chamber nearly full of pinkish exudate. Pupil slightly dilated, though under atropin given by Dr. C. W. East, family physician. History,

two previous attacks. The first eighteen years ago—two years after luetic infection. First and second attacks of iritis run about six weeks. Present attack, one week. Has some rheumatism, and just had boil on arm. Is taking K. I. and mercury. Streptococcus vaccine was ordered, as my diagnosis was rheumatic iritis. On the third day there was an improvement as shown by lessened congestion and less pain. A second injection was given in five days, and eye was so well he left for Michigan.

Case 2. Mrs. E. October 2, 1908. Sixth day of left iritis, probably rheumatic. Was treated by atropin, heat and salicylates, and run the usual course for two weeks. As the inflammation showed no reduction, streptococcus vaccine was injected. Pain and congestion lessened in forty-eight hours. No further improvement in ten days and a second injection was given, with marked improvement in forty-eight hours, and then gradual return to the normal.

Case 3. C. A. February 16, 1909. Three years ago treated by me for right iritis, losing three weeks' work. This attack in left eye, and injection given of streptococcus on third day, February 19, 1909, when diagnosis was positive. February 22, congestion less; marked improvement. Second injection on February 27, although eye was about well. He lost one week from work.

Choroiditis.—Mrs. L. Circumscribed choroiditis, subject to neuralgia and rheumatism. Streptococcus was given every two or three weeks during the winter, stopping the choroiditis and lessening the neuralgia considerably.

I should advise streptococcus vaccine in rheumatic iritis and uveitis; in threatened and acute suppuration of middle ear until smear can be made; in penetrating wounds of eyeball; in rhinitis, especially if accessory sinuses are involved. The staphylococcus should be used

in phlyctenular ulcerations and in simple ulcers until a smear shows the infection. If no facilities are at hand to determine the infection, I can see no objection to using a combination of streptococcus and mixed staphylococcus, or alternate the injection, giving a dose of each every five to seven days.

CHAPTER XVIII.

SOME EXPERIENCES WITH VERTIGO.

Extensive research into the cause of vertigo has been conducted by investigators abroad and in this country during the last few years. That the cause of this disagreeable ailment has been traced to disturbances in the internal ear is indicated in an exhaustive article by Dr. George E. Davis* who concludes:

"The internal ears are the special sense organs of equilibrium. With the internal ears we recognize (orientation) and maintain our relations to space (equilibration).

"The visual sense organs (the eyes), and the kinesthetic sense organs (the muscles, etc.), are accessory sense organs of equilibrium and are co-ordinated with the special sense organs of equilibrium (the internal ears), through the mediation of the cerebellum.

"The two special sense organs of equilibrium (the internal ear on either side), are normally symmetrical in structure and function, and any factor whatever, whether it be physiologic, experimental or pathologic, which enervates, stimulates or irritates one of these twin organs in excess of the other (or on the other hand accomplishes the same thing through enervation, depression or destruction of one in excess of the other), in that measure

**Journal A. M. A.*, Oct. 8, 1910, page 1277.

tends to or creates proportionately a disturbance of equilibration is of sufficiently marked or intense we also get nystagmus and that unpleasant and complex phenomenon termed vertigo."

When we consider the close association of the internal ear to the middle ear, we can reasonably account for many of the cases of vertigo that are associated with infectious conditions of the middle ear. Clinical observations in rheumatism show that joint disturbances may exist in all the varying degrees of severity, from a slight disturbance to a severe inflammatory process, and all caused by the same pathogenic organism. There seems to be no good reason why infective processes may not disturb the internal ear sufficiently to cause a disturbance of equilibrium and remain somewhat constant just as a joint may be slightly disturbed by a similar process.

Inflammatory troubles of the ear are so often caused by the streptococcus that to treat vertigo with the streptococcus vaccine is quite a logical deduction. At all events experience is a good teacher and my experience justifies the opinion that in streptococcus vaccine we have a most valuable remedy in this distressing ailment.

A man called at my office for treatment. He was tall, well developed, and appeared in good health, but complained of persistent attacks of vertigo. This condition was steadily growing worse, although he had been under the care of one of the best physicians in Detroit for four months. He was a foreman in a pattern shop, but found it difficult to walk about to attend to his work.

No well-defined reason for the vertigo could be found. On careful investigation I realized that by giving medicines probably nothing more would be accomplished than by the previous treatments. Shortly prior to that time I had treated a case of nasal catarrh with streptococcus vaccine in which a peculiar dizziness or "nervous dancing of objects," as the patient described it, was incidentally completely relieved. From this clue I decided to treat this case with streptococcus vaccine, giving 30,000,000 with each inoculation at seven-day intervals. After the second dose he was much improved. Treatment was continued for two months, and a complete cure was effected. It is now three years since treatment was started and the vertigo has not returned.

Another similar case is that of a man working in the dynamo room of a large power plant. He would be seized with spells of vertigo sufficiently severe to cause him to fall to the floor. He had been treated by several physicians, but was steadily growing worse. His hearing was good, but he complained of a noise in one ear. Four doses of streptococcus vaccine at intervals of one week effected a cure. A year later the vertigo returned. This time it required six doses to effect a cure. It is now eight months since the last treatment, with no return of the vertigo.

I was called to treat an old lady having vertigo with a vaso-motor disturbance which caused the skin to become markedly flushed. The vertigo was persistent whether walking or lying down, and was so severe that she could not walk across the room unaided. This con-

dition had existed for some months. I persuaded her to allow me to treat her with vaccines. When I called to give the third dose of vaccine she sat in the hall at the open door. Expressing my surprise at seeing her there, I asked how she got down stairs. She informed me that she walked down alone and in my presence she walked upstairs to her room alone. The improvement in her vertigo was remarkable. She very much disliked hypodermic injections, but I managed to get her to take a third dose. I have since lost track of her and am unable to say how she is now.

A young woman with previous good health had been under treatment by a physician for seven months for vertigo and other disturbances that went with it. She had some neuralgic pain on left side below the heart, appetite was poor and she had lost twenty pounds in weight, weighing at the first visit to my office 108 pounds. She described the sensation as being similar to that of riding in a small boat on rough, rolling water. The vertigo improved steadily after using the streptococcus vaccine and after taking ten doses she is entirely restored to health. Her last inoculation was given six months ago and the vertigo has not returned.

A middle aged man employed as a wagon maker complained of vertigo of six weeks' standing with a ringing in the right ear. The vertigo entirely subsided after six inoculations of vaccine.

A middle aged lady complained of noise in the ear with vertigo and difficulty of hearing. This condition had existed for about three weeks. After three inocu-

lations her vertigo disappeared and the hearing was materially improving.

A man employed as chief electrician in a large power plant consulted me concerning a vertigo of about five months' standing. He described his condition as "feeling about half drunk all the time." There was no apparent ailment that the condition could be ascribed to. His habits were good and regular. I gave him streptococcus vaccine, making inoculations at seven-day intervals. He began to improve after the first inoculation and was completely cured after five doses. It is now twenty months since the last inoculation, and no vertigo has returned.

Four other cases of vertigo were successfully treated with streptococcus vaccine, the details of which would not materially add to what has been already said. Vertigo is such a disagreeable affliction that any remedy promising a cure should be given a trial.

CHAPTER XIX.

DIGESTIVE DISORDERS.

Soon after using vaccines in cases having chronic rheumatism, I was impressed with the tonic influence which seemed to be exerted on the system generally and more especially with the beneficial effects on the digestive organs, improvement in the digestion often taking place before the inflammatory conditions of the joints began to be improved. This tonic influence was also observed when vaccines were given for bronchitis, "colds" and other troubles. Here I can speak from personal experience, having myself taken vaccines for "colds" with which I formerly was bothered very much. The appetite is one of the kind in which a lunch between meals is looked for, and the digestion is equally good.

From such experiences the idea of using vaccines in cases of indigestion where the trouble could not be ascribed to any organic cause naturally suggests itself.

A young woman complained of having had trouble with her stomach for seven years. Had lost thirty pounds in weight, and weighed only ninety-one pounds. Some tenderness on pressure over stomach was noticed and slight pain over the right hip and back. She ate very sparingly and complained of distress and belching of gas after eating. The tongue was coated, bowels partly regular, and she slept well. She had been treated

by many physicians, but was steadily failing. She had been referred to me by one of my vertigo patients and naturally was prepared for the vaccine treatment.

I started to treat her with streptococcus and colon bacillus combination making inoculations at seven-day intervals. After the fourth inoculation she began to improve and the treatment was continued until she had eight inoculations, then treatments were extended to fourteen-day intervals. During the summer she went to the country for a few weeks and came back with a fever. I did not recognize the character of the fever at first but soon found it to be a typical case of malaria. Vigorous quinine treatment broke up the fever, but all she had gained from the vaccine treatment was lost.

About a month after she had recovered from the malaria the vaccine treatment was started again. She began to improve again and is now taking inoculations about once in four weeks. She has gained six pounds in weight, feels stronger, has no more distress after eating and in every way is better than she has been in five years.

A middle aged woman had been bothered with indigestion for three years. I treated her with tonics and other conventional remedies for two months with no benefit. She had tried other physicians with no better results. I was at that time treating her father for rheumatism and the suggestion of giving a vaccine for her dyspepsia was readily accepted. She made a complete recovery after five inoculations of streptococcus and colon bacillus vaccine. I saw the lady recently and

she informed me that her indigestion has not returned. It is now over a year since I treated her.

I have used vaccines in other cases of digestive disorders and from what limited experience I have had, it seems to me that this line of treatment really deserves a wider range of application.

Many more interesting cases might be related from my experiences with bacterial vaccines, but it would seem that enough has been said to stimulate the general practitioner who reads this little volume into a desire to give this method of treatment a fair trial.

My experience justifies the opinion that bacterial vaccines will be far more generally used in the near future and from the remarkable results now being obtained in acute infections when treatment is started early, the general practitioner will not consider that he has done his full duty, unless he has these remedies at hand for immediate administration in such cases.

CHAPTER XXI.

SHERMAN'S BACTERIAL VACCINES.

From the first bacterial vaccine made in my laboratory — streptococcus — the list of the various bacterial emulsions has grown until it now comprises no less than twenty-six products. These include various standardized doses of certain microbic organizations and mixtures of others which, from clinical experience, would seem ought to be advantageously combined. Special mention should be made of combination P. for use in Pulmonary Tuberculosis in conjunction with either Tuberculin of the hygienic treatment, and for the treatment of certain bronchial complaints; combination I. for use in urethral infections of long standing and combination C. for infected wounds and puerperal infections. Besides these combination D. used in cystitis appendicitis and conditions where it is likely that the colon organism might be present and other combinations for treating mixed infections. Other products are made from single germs and particular care has been exercised to produce most accurate and effective products and also to standardize and sterilize the preparations before used. It is hardly necessary to say that all the recognized tests for safety and care are carried out with vigorous watchfulness.

Each vial contains one average adult dose. Children should receive from one-fourth to one-half of this amount. *The guide-letter is used for convenience in ordering.*

BACTERIAL VACCINES.

PREPARED IN THE BACTERIOLOGICAL LABORATORY OF
G. H. SHERMAN, M. D., DETROIT, MICH.

(License No. 30, issued to Dr. G. H. Sherman by the
Secretary of the Treasury, U. S. A., under provision of
Act approved July 1, 1902.)

G

STREPTOCOCCUS ERYSIPELATIS VACCINE 20,000,000.

Used in the treatment of erysipelas, and usually given
hypodermically at intervals of from 2 to 6 days.

Pneumococcus Vaccine 40,000,000
or *Pneumococcus Vaccine* 100,000,000.

Used hypodermically at intervals of from 2 to 4 days
in treating pneumonia. The best results are obtained
when given early in the course of the disease, the tem-
perature coming down and other conditions improving
in 24 hours after the first inoculation.

COMBINATION Q

MIXED VACCINE CONTAINING

Pneumococcus 30,000,000,
Streptococcus 20,000,000.

One adult dose. Children from one-quarter to one-
half this amount. Used in mixed pneumococcus and
streptococcus infections. This condition is often found
in broncho-pneumonia and in cases of lobar pneumonia,
following acute bronchitis. Also in nose, throat and
middle ear infections. Streptococcus vaccine frequently
has a marked beneficial influence in pneumococcus infec-
tions and in this combination is of value even if no strep-
tococcus infection exists.

A and T

Streptococcus Pyogenes Vaccine 60,000,000.

Streptococcus Pyogenes Vaccine 30,000,000.

Given hypodermically at intervals of from 4 to 7
days. This vaccine is very efficient in acute articular

rheumatism, usually giving relief in 24 to 36 hours. It should be given at 4 or 5 day intervals, until the swollen condition of the joints has disappeared. After that once a week to prevent a relapse.

In subacute and chronic rheumatism the inoculations should be given at 7-day intervals and continued from 6 weeks to 3 months or more.

COMBINATION P

MIXED VACCINE CONTAINING

Streptococcus Pyogenes 30,000,000,

Pneumococcus 40,000,000,

Staphylococcus Pyogenes Aureus 150,000,000.

This combination is especially useful in treating mixed infections in pulmonary tuberculosis. It is of primary importance to take care of the streptococcus, pneumococcus and staphylococcus infections in these cases, thus giving the patient a better opportunity to overcome the tubercle infection. Fresh air, tuberculin and other treatments may also be used.

This combination is also giving excellent results in chronic bronchitis. Treatments should be given about once a week.

In acute rhinitis, bronchitis, broncho-pneumonia in children, otitis media, mastoiditis, tonsillitis, pharyngitis and "severe colds" this preparation gives excellent results. In these acute cases inoculations should be made at from 3 to 6 day intervals.

COMBINATION C

MIXED VACCINE CONTAINING

Streptococcus Pyogenes 30,000,000,

Staphylococcus Pyogenes Aureus 100,000,000,

Staphylococcus Pyogenes Albus 100,000,000.

This is a convenient combination in cases of mixed staphylococcus and streptococcus infections often met with in infected wounds and puerperal fever. When

used early in these cases the infective process will be aborted and a speedy recovery will take place. This combination is also successfully used in inflammatory conditions where it is difficult to determine whether the infection is due to a streptococcus or staphylococcus. As a prophylactic in surgical cases this combination is being very advantageously used.

This combination is also giving good results in arthritis deformans. Treatment should be continued from 3 to 12 months.

COMBINATION R

MIXED VACCINE CONTAINING

Streptococcus Pyogenes 60,000,000,
Staphylococcus Pyogenes Aureus 200,000,000,
Staphylococcus Pyogenes Albus 200,000,000.

This combination is used the same as Combination C in cases where a larger dose seems to be desirable.

COMBINATION B

MIXED VACCINE CONTAINING

Streptococcus Pyogenes 30,000,000,
Micrococcus Catarrhalis 100,000,000.

This combination is being extensively used in bronchitis, rhinitis, pharyngitis and catarrhal conditions of the respiratory tract generally. Cases of chronic bronchitis that have resisted all other treatment are being cured with this preparation.

COMBINATION D

MIXED VACCINE CONTAINING

Streptococcus Pyogenes 30,000,000,
Colon Bacillus 40,000,000.

This combination is especially valuable in cases of acute appendicitis; in operative cases as a prophylactic and in other cases as a curative agent. If the treatment is started before extensive suppuration has taken place,

marked improvement will be observed in 24 to 36 hours, with reduction of temperature and inflammatory process subsiding. Inoculations should be repeated at from 2 to 5 day intervals. In subacute and chronic cases inoculations should be given about once a week. No feeding and absolute rest should be observed. In puerperal fever where the odor of the discharge indicates a colon bacillus infection and in peritonitis, this combination gives excellent results.

Cases of cystitis and pyelonephritis are also successfully treated with this combination.

M and N

Colon Bacillus Vaccine 40,000,000,

Colon Bacillus Vaccine 100,000,000.

For use in the treatment of colon bacillus infections of kidney, bladder and other abdominal organs.

V

Staphylococcus Pyogenes Aureus Vaccine 300,000,000.

Used in boils, abscesses, furunculosis, infected wounds and staphylococcus aureus infections generally.

S

Staphylococcus Pyogenes Albus Vaccine 300,000,000.

Used in acne and other staphylococcus albus infections.

COMBINATIONS E, H and O

MIXED VACCINE CONTAINING

Staphylococcus Pyogenes Aureus and
Staphylococcus Pyogenes Albus, Each 100,000,000.
 " 200,000,000.
 " 300,000,000.

This combination is preferably used with excellent results in boils, abscesses, furunculosis, acne, eczema, infected wounds and staphylococcus infections generally.

Also in arthritis deformans alternately with streptococcus vaccine. The smaller dose should be used at first and, after a few doses, the larger doses should be resorted to.

COMBINATION W

MIXED VACCINE CONTAINING

Staphylococcus Pyogenes Aureus 100,000,000,
Staphylococcus Pyogenes Albus 100,000,000,
Staphylococcus Citreus 100,000,000.

This combination is used in the same class of cases as staphylococcus albus and aureus.

L

Gonococcus Vaccine 20,000,000.

One usually starts with one-half this amount. This preparation is giving good results in acute gonorrhea, marked improvement being noticed in 1 or 2 days after the first inoculation; the most striking results being observed where there is extensive deep-seated infection, as in orchitis epididymitis, infected lymphatic glands, etc. At first the inoculations should be repeated from 2 to 4 days apart, later from 5 to 7 days apart. After the second or third inoculation, local treatment should be employed to take care of the surface infection.

In stubborn cases the dose should be increased to 50,000,000 or 100,000,000.

COMBINATION I

MIXED VACCINE CONTAINING

Gonococcus Vaccine 100,000,000,
Staphylococcus Albus 400,000,000.

The strains of staphylococcus in this combination are taken from cases of chronic gonorrhea. This is a good combination in chronic and subacute gonorrhea. It

should be given at weekly intervals, preferably starting with one-fourth the above dose. Ordinary recognized local treatment should not be neglected in these cases.

COMBINATION K

MIXED VACCINE CONTAINING

Staphylococcus Pyogenes Albus 400,000,000,
Staphylococcus Pyogenes Aureus 200,000,000.

This vaccine is made from strains of staphylococcus albus and aureus in cases of chronic gonorrhœa. It is used in cases of chronic gonorrhœa where the gonococcus has disappeared or is no longer an important factor in the discharge. It should be given at intervals of from 5 to 7 days. Ordinary local treatment should also be employed at the same time.

F

Gonococcus Vaccine 100,000,000.

In clear cases of gonorrheal rheumatism uniformly good results are obtained with this vaccine. Inoculations should be made at intervals of 1 week. It is well to start with one-third dose and increase as the case progresses. Stubborn cases may require 200,000,000, 300,000,000 or even more to a dose before they are cured. Where no improvement is observed after three or four inoculations the case should be treated with streptococcus vaccine as a case of ordinary rheumatism.

X, Y and Z

Typhoid Bacillus Vaccine 50,000,000.

Given hypodermically at intervals of from 4 to 8 days. This vaccine is coming into extensive use in treating typhoid fever. Some very good results have been obtained.

Typhoid Bacillus Vaccine 500,000,000
or *Typhoid Bacillus Vaccine* 1,000,000,000.

This vaccine is being extensively used for immunizing purposes in cases that have been exposed to typhoid infection and for immunizing soldiers in the armies, 500,000,000 being given for the first dose and 1,000,000,000 a week or 10 days later.

CHAPTER XXI.

SOME LETTERS REGARDING VACCINES IN GENERAL PRACTICE.

In other parts of this little volume I have frequently mentioned my own personal work. Although 5,000 doses is quite a good many for one man to have given in less than five years, my experience is by no means limited to my own work, but speedily extends beyond the confines of my practice. As a matter of fact several hundred physicians have more or less accidentally come in contact with my work and have used my preparations to a greater or less extent. It would seem that the inclusion here of a few statements from some of them might add to the value of this book, take away its possible one-sidedness (for I confess that there is quite a good deal of personal experience in it) and serve to more thoroughly convince the reader that this is no dream but a firm reality.

It is a pleasure, therefore, to have the privilege of including the following extracts from a voluminous and very encouraging correspondence:

Mt. Clemens, Mich., November 22, 1910.

DEAR DOCTOR:—

I have been using your bacterial vaccines for over a year in my practice at Mt. Clemens, where for the last seventeen years special attention has been given to a class of diseases that come to us for treatment with the

mineral baths. Since using the various vaccines for the different cases, as indicated in your circular, my cures have been more permanent and obtained in a much shorter time.

There have been no unpleasant symptoms following the use of your vaccines, which is one reason why they are given the preference in my practice at Mt. Clemens, over other vaccines.

Yours fraternally,

JNO. A. LENFESTEY.

Detroit, Mich., November 29, 1910.

DEAR DOCTOR:—

I wish you to know of some of the success I have had with your bacterial vaccines.

In a case of rheumatism in a man of fifty years, after using the old standard remedies with only slight perceptible improvement, he developed a phlebitis of the veins of the arms. I began the use of your mixed vaccine of streptococcus and staphylococcus. By the time the effect of the second dose wore away the symptoms began to subside. The phlebitis disappeared in two weeks and all soreness in the hands in three weeks.

In a case of posterior urethritis with high fever I used the vaccine in conjunction with irrigation. The vaccine certainly reduced the fever and lessened the discharge.

Very truly,

F. E. BOWMAN.

Rockford, Ill., November 28, 1910.

DEAR DOCTOR:—

I wish that time would permit me to give a little report of the success I have had with the use of bacterial vaccines which I have been buying from you for the last year. Some time during the year I will try to give you a detailed report. Let me say, however, that I have used, as you know, several varieties and have used

a great many doses of each and in their use I have not met with one unpleasant result. While I did not always get as good results as I might have wished, there has never been one dose that gave the least bit of discomfort to the patient. One could hardly expect in using stock vaccines to *always* get results. However, I feel I can well afford to use them because they so seldom fail me. I have had splendid success with them.

I might mention one case of a young lady who was developing arthritis deformans. She had been steadily growing worse for the last two years although she had not reached any great degree of deformity. Her infection was obscure, but her suffering was intense. I used a mixed vaccine and she got immediate relief from the pain which I had even been unable to control with small doses of opiates. I repeated the dose once a week for about ten or twelve weeks at which time she seemed to suffer none, the swelling of her joints had subsided and she considered herself well. She has been free from treatment and trouble for about three months.

In acne I did not always obtain equally good results but have never failed to get some relief and several cures. One case of a young man who had suffered for about ten years, whose face, neck and shoulders were completely covered with large, red pustules I have had under treatment about six weeks using one injection every fifth to seventh day, and he is practically well.

I might mention many other cases, but would take too much of your time. I am today sending you an order for more and do not expect to be out of them so long as they serve me half as well as they have in the past.

Yours very truly,

JOHN E. TUITE.

Attica, Ohio, November 22, 1910.

DEAR SIR:—

I have been using *Streptococcus Pyogenes* Vaccine very extensively for the last eight months and find in all acute cases 1 to 3 doses effect a complete cure. In cases of three or four months' standing it takes from six to ten doses to effect a cure. It has not failed in a single incident with me. In chronic rheumatism there is always improvement and I have some patients of this kind on this treatment now and they are all pleased with the benefits they receive.

Recently I had a case of septicemia. Young woman who contracted the disease from old clothing which she was assorting having an open sore on the point of finger. When I first saw her, the sore was badly inflamed, there was a streak one-half inch wide reaching to elbow, arm swollen and very tender and sore on pressure or movement, pulse 130, temperature 1 degree below normal, tongue heavily coated, bowels constipated, patient dull and apathetic, no appetite, general condition alarming. Gave the mixed vaccine (C) and she made a steady and complete recovery.

E. M. HALL, M. D.

Detroit, Mich., November 25, 1910.

DEAR DOCTOR SHERMAN:—

I have used your bacterial vaccines for more than two years, in cases where the diagnosis indicated them and always have been pleased with the results obtained.

I believe them to be the most scientific and effectual therapeutic agents we have, in selected cases, to assist nature in curing disease.

In early infections where there is good resisting power, the results obtained, in some cases are most

marked. The same is true in many chronic cases as well.

Yours truly,

DR. GEORGE CAMPBELL.

Van Buren, Ohio, June 7, 1910.

DEAR DOCTOR:—

On May 1, 1908, Mrs. W. D. applied to me for treatment. I found her suffering from rheumatism, having had three attacks of acute articular rheumatism in the last five years. Knees and ankle joints almost completely ankylosed. She had been completely "bedridden" for two years, and could go about on crutches only for the three years previous to the two years she was continuously confined to her bed. She had been treated by many physicians, some of the best in Northwest Ohio, and had taken every conceivable remedy for rheumatism. It seemed a hopeless case, but as she had never taken any streptococcus vaccine, I concluded to give her a trial of it. After the third dose she began to improve. I continued this treatment, giving one injection every sixth day, being free from all pain, and troubled only with stiffness of ankle and knee joints. This condition is improving with massage and use of the joints, and I expect a complete recovery.

DR. E. W. HALL.

Detroit, Mich., November 10, 1910.

DEAR DOCTOR SHERMAN:—

I have been using your Streptococcus Pyogenes Vaccine and your Staphylococcus py. aureus Staphylococcus py. albus mixed with Streptococcus py. Vaccine in several cases of rheumatism of different varieties. The results have been good in seventy-five per cent of the cases and extremely surprising and gratifying in several instances.

I have also used your Gonococcus Vaccine in five cases. Two have been clinically cured; the other three are still under treatment. All were chronic cases. I do not think I have used these vaccines in a sufficiently large number of cases to judge of their ultimate value as a therapeutic agent but from my limited experience I am strongly predisposed to their use and do so with a great deal of interest.

Very truly yours,

O. S. ARMSTRONG.

Rockford, Ill., June 25, 1909.

DEAR DOCTOR:—

As I use bacterial vaccines more, and learn of the indications for them and their various uses, I am becoming more enthusiastic about their value. In simple iritis I find an early dose of the streptococcus vaccine of the greatest benefit in most cases, and if my experience in a few cases shall be continued in others, I shall give each patient with operation, or other wound of the eyeball, an immediate dose of the same. I shall also give it in the early stage of cold in head or throat, as it seems to promptly check the cold. A patient has just gone home upon whom I operated two weeks ago for cataract. The day of the operation I gave him 30,000,000 streptococcus. Though in a number of respects it was far from a favorable case, he recovered without a single bad symptom. Although the weather has been raw and damp, and although the patient says he takes cold on the slightest pretext, he had no symptom of cold while convalescing. In some patients the result has been negative, but in no instance have I seen any unfavorable effect.

Very truly yours,

HORACE M. STARKEY, M. D.

Miller, Mo., November 28, 1910.

DEAR DOCTOR:—

I am pleased to tell you that the marked benefit my patients have received from the use of your Bacterial Vaccines encouraged me to continue their use. I can report cures of Chronic Rheumatism and Pneumonia. Cases of Gonorrhea and other diseases cured by Vaccines seem to stay cured. Thank you very kindly for the good work you have accomplished in putting on the market reliable Bacterial Vaccines of different kinds for the doctor's use—and at such a reasonable price.

Yours very truly,

C. P. POWLEY, M. D.

Detroit, May 25, 1910.

DEAR DOCTOR:—

Bacterial vaccines are no doubt of material benefit in treating disease. I have had good results in treating chronic gonorrhea with your staphylococcus albus and gonococcus combination. Have also had good results with your streptococcus vaccine in treating articular rheumatism. Am now using vaccines in my surgical cases as a prophylactic to assist the patient in combating infections that might take place. In surgical cases, where infections exist prior to the operation, the vaccines are of great value in hastening repair.

Yours very truly,

DR. F. J. W. MAGUIRE.

Rockford, Ill., November 22, 1910.

DEAR DOCTOR:—

In response to your inquiry as to my experience with your vaccines — briefly, I have been using them for the past year. In chronic Neisserian infections, I have used

the vaccines in conjunction with local and constitutional measures and the results in the majority of cases have been most gratifying. In acne vulgaris, results have been positive and unmistakable; in acute tonsillitis, I have reason to believe that the duration of the attack is shortened and the symptoms greatly ameliorated.

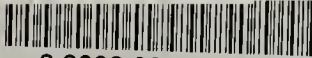
Very respectfully,

GEORGE P. GILL.

Detroit, Mich., May 31, 1910.

My experience with vaccines manufactured by Dr. George H. Sherman extends over three dozens of cases. Most notable were the cures effected by the streptococcus vaccines in cases of acute articular rheumatism, puerperal fever, septic wound. Incipient cases of tuberculosis are remarkably benefited by full doses of streptococcus vaccine. It does not seem necessary to use autogenous vaccines to obtain good results, ordinary stock vaccines having proven exceedingly efficient. I have at no time resorted to the opsonic index, giving the injections five or six days apart, and in no case have I noticed untoward results. One or two timely injections seem to be sufficient in most acute cases, but do not hesitate to give more if necessary.

A. G. HUEGLI, M. D.



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